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ABSTRACT

The term "educational pipeline" refers to the lifetime of educational experiences incurred by students in the American education system. It is thought that students' experiences at any point in the pipeline can affect future outcomes. For colleges and universities, access and retention are critical issues affected by "leaks" in earlier segments of the pipeline. Recent efforts by the federal government to improve institutional accountability have looked to student retention rates as important markers. Successful retention programs consider the early educational needs of diverse populations. School-college partnerships identify and engage multiple stakeholders across the educational spectrum in an effort to redesign and bolster the pipeline and to help ensure success for students once they reach college. School-college partnership isn't new; collaboration has existed for much of the 20th century. In the 1980's, the movement for increased partnership gained momentum. Today, technology plays an important role in helping to develop these partnerships. Differences in configuration include varying sizes and scopes of partnerships. Both benefits and impediments exist within partnerships. Overall, school-college partnerships are important to the success of students, regardless of cultural or gender differences and learning needs. Contributors to this volume discuss specific examples of working programs in existence today. (HB)

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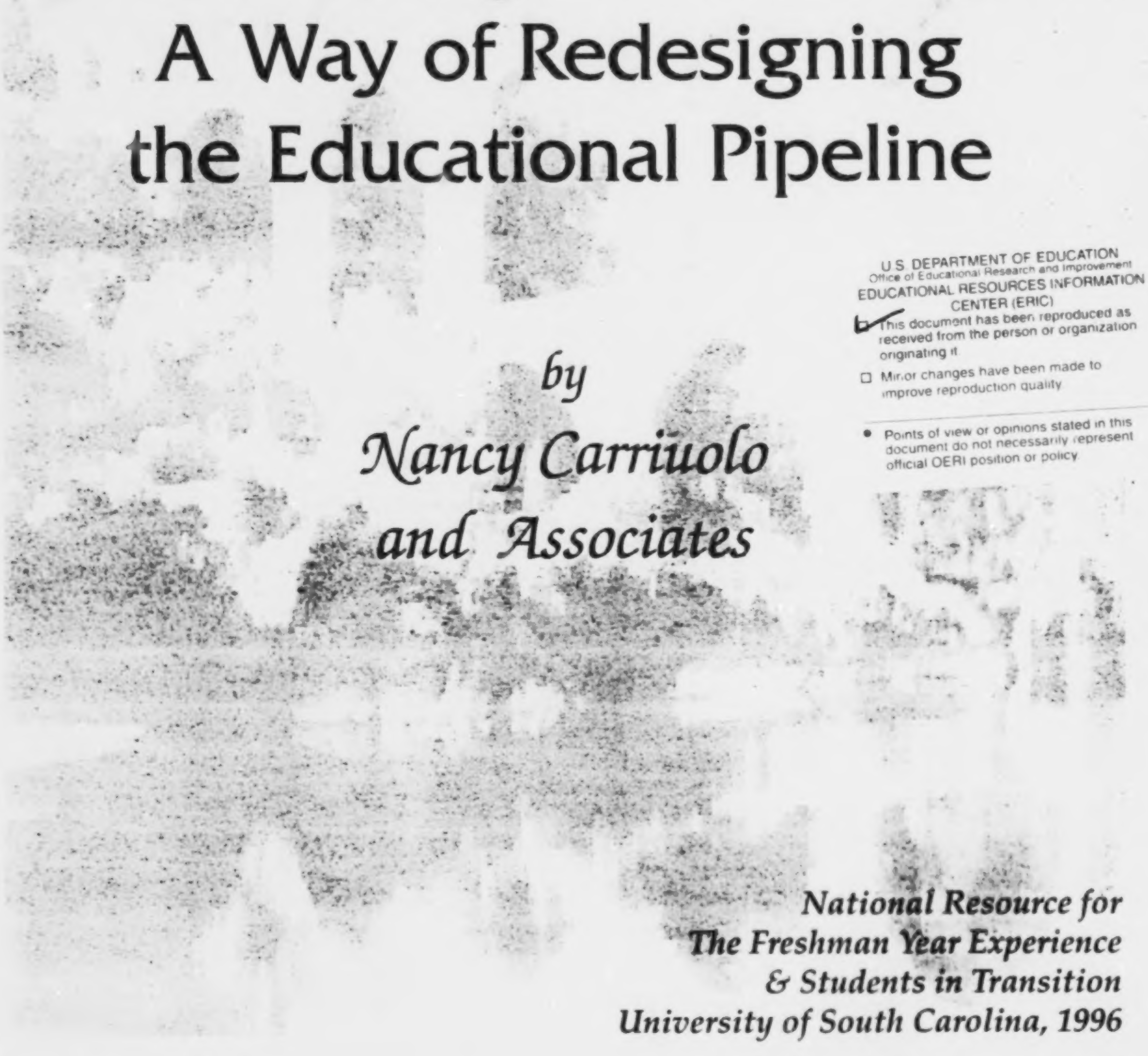

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by

Nancy Carriuolo
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National Resource for
The Freshman Year Experience
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University of South Carolina, 1996

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Acknowledgments

Over 25 years, I have learned from many experienced collaborators from schools and colleges as well as from business leaders and other people interested in education. Although college professors and association staff are the chief contributors to this monograph, their partners in schools, businesses, and community groups are active, vocal contributors to all the partnerships discussed in this publication. College professors and staff of associations simply have more time to chronicle the activities of school-college partnerships than do their school and corporate partners whose cultures do not usually require publication as a continuous professional activity.

I warmly thank Dr. Bard Hamlen of Lesley College, who read the first draft of this monograph and helped me to frame the questions that were likely to be on the minds of readers who were not yet immersed in the collaborative movement. I also wish to thank Dr. Mary Alice Wilson, coordinator of the Five Colleges/Public School Partnership, who read and commented in detail on the next-to-final draft of this monograph. In addition, each contributor to the manuscript read the early drafts and offered suggestions in true collaborative fashion. Others, such as Dr. Richard Bradley, former Executive Director of the New England Association of Schools and Colleges, and Dr. Franklin Wilbur, Vice Chancellor at Syracuse University, provided me with information and encouragement. I thank them for their special help.

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Lastly, I give thanks to John Gardner, Director of the National Resource Center for The Freshman Year Experience and Students in Transition, at the University of South Carolina, for suggesting this topic, and Dr. Dorothy Fidler, National Resource Center Managing Editor, and Scott Bowen, Assistant Editor.

Nancy Carriuolo
October 1995

Foreword

by John N. Gardner

It is with great pleasure that we here at the National Resource Center for The Freshman Year Experience and Students in Transition release this monograph. The topic is the use of partnerships between all sectors and tiers of education, from elementary school through college, for the improvement of the first-year experience. All of us who care deeply about improving the learning, success, satisfaction, retention, and ultimate graduation of first-year students have many times lamented that for some of our first-year students it is too late for us to give them the kind of help they need to fulfill their potential in the first year of college and beyond. How we wish that we could have addressed the development of their potential earlier in their school careers — at the very latest in secondary school, but preferably in middle school and even earlier. Thus, those of us who are dedicated to the improvement of opportunity and success for first-year students have long concerned ourselves for what are known overall as "pipeline issues."

Increasingly, we have realized that if we are to be successful in the first year, and simultaneously avoid lowering our all-important standards for first-year students, then our working with these students before they actually reach us becomes vital. The best way to do this, of course, is to work with school teachers, counselors, principals and others in the kindergarten through twelfth grade sectors. This critical concept has become known as the school-college partnership, or school-college collaboration.

I became familiar with this academic movement in the 1980s when I became very active in the American Association for Higher Education. While serving a four-year term on the Board of Directors for AAHE from 1990-1994, I learned of the exciting and important work of AAHE"s School-College Collaboration Initiative, and through that process I met the editor of this monograph, Dr. Nancy Carriuolo.

Nancy Carriuolo had the invaluable experience of providing direction for an office of school-college relations at one of our nation's six regional accrediting associations, the New England Association of Schools and Colleges. The more I learned about her work, and its importance, the more I realized she would be a very appropriate lead author for a monograph on the subject of school-college partnerships. Hence, we invited her with the hope that her work and that of her colleagues included in this monograph would help inspire educators to initiate or continue to pursue school-college collaborations.

Long gone are the days when we in higher education can go it alone, do it all ourselves — if we ever could. The desirability of the school-college partnerships was a classic example of the need to connect our college and university campuses to our external communities more than ever. The topic of this monograph also serves to suggest one further illustration of how we will never truly fulfill our potential as institutions to teach first-year students successfully as long as we make first-year support programs peripheral to the central academic mission of a university. Thus, many of us involved in the first-year experience support network strive and sometimes struggle to involve in this effort more classroom educators from all levels. Thus, at the heart of this monograph is the means for doing just that: the means to bring together all kinds of educators and resources that send students to college and keep them there.

I recommend for you this compelling monograph in the hope that your institution can reap the potential of school-college collaboration and partnerships for the ultimate betterment of the academic and personal success of your first-year students.

Book I

School-College Collaboration: A Way of Redesigning the Educational Pipeline

by
Nancy Carriuolo

Chapter 1

College Access and Retention: Major Segments of the Educational Pipeline

The American system of education stretches across a lifetime from nursery school to elementary school, to junior high to high school, to a two- or four-year college or postsecondary training, then to postgraduate study. These loosely linked educational experiences are commonly referred to as the "educational pipeline." This pipeline is actually a system of various educational channels. All students enter this pipeline, but not all traverse the length necessary to earn a proper education. Each educational institution is either a pump that propels students forward in the pipeline, or a filter that intentionally sifts out students who fail to meet expectations (Treisman as cited by Wheeler, 1992). The pipeline system also has some unintentional leaks through which students exit if they, for myriad reasons, opt not to continue their educations. From its beginnings in early childhood education, the pipeline narrows as it travels with an ever diminishing load over uneven ground until reaching a point where graduating high school students move forward into either college or a series of other channels leading to either postsecondary training, a paid position, homemaking, military service, or often less desirable options such as welfare or incarceration. The channels connect with each other at various points, but negotiating this maze, and connecting with the college segment of the pipeline, in particular, is not easy.

Most colleges and universities wish that the school-to-college pipeline would directly deliver a larger, more diverse, and better prepared pool of undergraduate applicants. After all, students who were highly successful in high school should be successful in college, or so it seems. Students and parents believe that freshmen who are admitted to an institution are capable of graduating and finding a job in their fields of study. Yet, even the most prestigious institutions that can choose among the nation's most qualified students fail to graduate all those who are declared fit at the time of their admittance, and institutions with an open admission policy lose many students who are then without a degree and are faced with accumulated debt. The admissions department of the institution must expend more dollars to recruit new students to take the place of those who have left. The public, students, and regulating groups are increasingly less tolerant of this clearly wasteful and untenable situation.

Too often colleges and universities know exactly how many students apply and how many are accepted, but are less clear about the experiences of those students thereafter as they progress in the college pipeline toward graduation. The federal government's inclination is to make institutions more accountable. The government's concern was prompted by students' unacceptable default rates on student loans rather than by students' attrition, but the government's new focus on accountability may lead institutions to look more closely at student retention in relation to graduation rates. According to a summary of the final regulations by the U.S. Department of Education (1994), published to implement the amendments of the

Higher Education Act of 1965, (HEA), accrediting agencies, states, and the federal government are a triad of gatekeepers that must ensure that student financial assistance programs, (Title IV of the HEA), are available only to "those institutions that provide students with quality education or training worth the time, energy, or money they invest in it" (p. 22250). The U.S. Department of Education (1994, April 29) is also developing a new integrated database, the Postsecondary Education Participation System, that will contain information generated by the Secretary's oversight of institutions participating in Title IV, HEA programs (p. 22250). The data will include graduation and withdrawal rates at various types of institutions (p. 22251).

Such data may be used to monitor college student retention. Periodic head counts do reveal the numbers of students who leave college and the time when they withdraw, but they do not tell the stories behind their reasons for leaving. Some students drop out for very good reasons, such as family illness, but they are not really lost from the pipeline for they later return to college and complete their degrees; they simply take a detour or rest stop. Still others opt to leave because they never intended to complete a degree — they wished to take a course or two in an area of interest or need only. Other students, particularly those who began as underprepared freshmen, are likely later, when they are prepared, to transfer from a community college to a four-year college or from one four-year institution to another that is more prestigious.

Other students, however, are truly lost from the pipeline. They leave because of problems that often could be solved with appropriate intervention. These students could and should have been helped to complete their undergraduate degrees and prepare for any further education they may desire.

Retention programs on some college campuses provide targeted groups of students with much-needed academic and social support as they move through college. According to Kluepfel (1994), the U.S. Department of Education has identified nine colleges and universities with exemplary retention programs. Interventions range from alumni follow-up to precollege programs. Of the nine exemplary retention programs, two were precollege programs: the Summer Bridge Programs at the University of California at Berkeley and the University of Virginia. Summer Bridge, as the name implies, gives selected underprepared students a bridge from high school to college. Following graduation from high school, the student spends a summer on the college campus building academic and study skills, becoming acquainted with the resources and expectations of a college, and becoming part of a campus community and support network. These particular programs also provide conditional admission to the institution depending on students' success in the programs.

Although some retention programs attempt to bridge the movement of students from the final year of high school to the beginning of college, retention programs usually focus on students who have already successfully completed school. They do not reach students who never succeed in school and who never apply for college. As early as preschool, these youngsters are often filtered out of the group being propelled toward college. Hodgkinson (1991) says that "about one-third of preschool children are destined for school failure because of poverty, neglect, sickness, handicapping conditions, and lack of adult protection and nurturance. . . The fact is that more than one-third of American children have the deck stacked against them long before they enter school. Although America's best students are on a par with the world's best, ours belong to what is undoubtedly the worst 'bottom third' of any of the industrialized democracies" (p. 10).

In addition to the bottom one-third who have the "deck stacked against them before even entering school," even the so-called *best* students to whom Hodgkinson (1991) alludes do not always pass smoothly through school and on to college. The Policy Information Center (1991) of the Educational Testing Service defined *high ability* students as those seniors who scored in the top 25% on tests given as part of ETS's 1980 High School and Beyond Study. The Center found that "one in 10 of these 'high ability' seniors in the 1980 study did not enter college upon graduation, and almost two in five entered two-year rather than four-year institutions, although some later transferred to four-year institutions" (p. 30). Half of these seniors are estimated to have received a bachelor's degree by 1987, and just one in eight entered graduate school or post-baccalaureate professional schools by 1987. Although critics of the study might question use of the term *high ability* and the tests upon which the label was based, the fact remains that diverse groups of students do not complete high school and go on to further education either immediately or in the next several years.

The educational pipeline clearly leaks from early childhood throughout the educational continuum. In order for this pipeline to ferry greater numbers of students from early childhood education through graduate school, faculty and administrators from preschool through graduate school must discuss the loss of students at each educational level and learn to support each other's efforts to address problems that result in attrition. They must also attract others outside education: funders, business and industry, social service providers, and other community-based groups interested in education. All of these groups have human and financial resources needed to undertake the gargantuan job of redesigning the school-to-college pipeline.

School-college partnerships, consisting of local organizations of schools, colleges and universities, and interested others in the community, bring together all the stakeholders just cited. School-college partnerships use collaboration as a tool for redesigning the pipeline. Collaboration between schools, colleges and others interested in education brings together representatives of all the segments of the pipeline to identify mutual issues of concern, develop goals, and forge new joint programs. School-college partnerships, when they function well, promote access to college for greater numbers of students as well as a greater likelihood that students will be successful in college.

Chapter 2

Evolution of the School-College Movement

Although the national school-college partnership movement is still new enough to be growing and developing at a rapid pace, the concept of schools and colleges collaborating is not new. Its roots can be traced to the late nineteenth century when Charles Eliot, President of Harvard, was instrumental in convening a conference of school and college faculty. According to Monbouquette (1972), the group discussed several subjects including teaching methods, relative emphasis to be placed on various parts of the subjects being taught, the curriculum of preparatory schools and methods of regulating admission to colleges (p. 29). In 1885, the New England Association of Colleges and Preparatory Schools, now known as the New England Association of Schools and Colleges, the oldest of the regional accrediting agencies, came into being as a result of this conference. The association was formed to foster "continuous rather than irregular cooperation" between schools and colleges (Monbouquette, p. 30). Preparatory school curriculum and admission requirements continued for several years to be the focus of the new organization. According to Clark (1988) another eventual outgrowth of this 19th century conference was the development of the College Entrance Examination Board, which administered the first scholastic aptitude test in 1926 (pp. 42-43). Curriculum, admission requirements, and testing were issues that brought schools and colleges together over a century ago and continue to do so.

Another milestone occurred in 1930 when the Progressive Education Association convened a commission on the relationship between schools and colleges. The focus of the commission's discussions related largely to curricula and preparation of students for a college course of study. The commission, following an eight-year study, encouraged schools and colleges to coordinate their efforts. The efforts dissolved with the onset of World War II (Clark, 1988, pp. 43-44). The appropriate preparation of students for college appears to be a long-standing issue that has fueled much discussion but continues to elude solution.

Yet another concern which brought early groups of school and college educators together was teacher preparation. Since the early 19th century, student teaching has linked schools (kindergarten through twelfth grade) to colleges and universities, but the link was not between equals, and equality is vital in a true partnership. While the college's department of education was traditionally the authority, the local elementary, middle, or high school was primarily a laboratory for research and teacher training. Furthermore, colleges without a department of education had either little or no connection with schools other than through the college admissions process.

By the mid-1970s, only several hundred school-college partnerships existed, and they focused on either the long-standing teacher training programs of schools and colleges or on more innovative incentive programs for helping primarily disadvantaged students (Wilbur as cited in Graves, 1992, p. 12). Of particular note during this period of growth of school-college partnerships were summer training programs in the sciences sponsored by the National Science Foundation (NSF) (Mary Alice Wilson, coordinator of Five College/Public School Partnership, Amherst, Massachusetts, March 9, 1995, personal communication).

While school-college partnerships were forming in the 1960s, their growth was roughly paralleled by the development of fledgling school-business partnerships. The National Association of Partners in Education (NAPE) was formed in 1988 as a merger between the National School Volunteer Program, whose first organized school volunteer program dates back to 1956, and the National Symposium on Partnerships in Education, an annual meeting organized in 1984 to highlight exemplary collaborative efforts that focus on systemic change in schools and their communities. NAPE seeks to provide leadership to educators, citizens, businesses, and other community organizations that wish to come together to create community-wide systemic change in regard to educational improvement and reform. The organization currently has 7500 member grassroots programs that involve business, higher education, schools, volunteers, and government as partners ("NAPE Overview," an undated fact sheet, Alexandria, VA, p. 1). (See Appendix of this monograph to contact NAPE.)

By the 1980s, many educators began realizing that no one group had either all the answers or resources needed to challenge and support the increasingly diverse student body entering America's classrooms. Consequently, in the 1980s a new spirit of collegiality ushered in the true beginning of the current school-college movement. In 1988, a large-scale study concluded that 80% of the school-college collaborations surveyed began after 1980 (Ascher, 1988, p. 5). During the 1980s, a wide range of programs for students and faculty developed, and working with schools was no longer the exclusive domain of a college's education department. Faculty from all disciplines, but particularly from Arts and Sciences, began to seek out opportunities to work with teachers who prepare students for college.

In the 1990s, partnerships are still often begun by local schools and colleges, but increasingly they are reaching out to include others interested in collaboration such as leaders from business, social services, museums, public libraries, community groups, and parent groups. Partnerships have become inclusive, not exclusive. A second exciting change is that some partnerships have begun discussing so-called systemic change in which local educational systems (not only schools but also local colleges) change their policies and practices to accommodate the needs of students in the educational pipeline. Thirdly, technology has also changed the scope of membership in school-college partnerships. Faxes, e-mail and other forms of electronic technology have fostered the growth of some international partnerships. For example, Bridgewater State College, Millis High School, and Wrentham Elementary School in Massachusetts are using the college's interactive teleconferencing facility to collaborate with teachers in Russian schools in order to meet the needs of disabled Russian children (Battaglino, 1994). Technology cannot take the place of face-to-face meetings. The early meetings of the partnership took place in Russia. However, the new technology allows the partners to continue their dialogue in a cost- and time-efficient way. Although most partnerships begin with local groups and local issues, geographic distances no longer determine the life-span or viability of partnerships in an age of global electronic communication.

Chapter 3

School-College Partnerships: A Lexicon and Overview

The term *school-college partnership* ideally signifies a long-term, reciprocal relationship forged between precollegiate schools and local postsecondary or higher education institutions, and often interested others such as local business or community groups. School-college relationships at their inception and during their formative years are not always intended to be either long-term or reciprocal. However, successful interinstitutional relationships often evolve into true partnerships over time.

The mission of a school-college partnership is to strengthen various aspects of precollegiate education through programs with specified goals. These goals either directly or indirectly affect the success of precollegiate students which, in turn, affects the size and diversity of the pool of students prepared for the next level of education.

All partnerships have common characteristics:

- Members of partnerships are treated as valued equals who try to identify and meet each other's needs.
- Successful partnerships set aside politics and turf issues in favor of reaching common goals.
- Partnerships' mutual goals also serve the needs of the individual institutions.
- To promote frequent communication, partnerships are usually limited to institutions within easy driving distance of each other.
- Partnerships are continuous relationships. To endure, they must become a part of the essence of the participating institutions; educational collaboration must be viewed as part of the organization's mission.
- Successful partnerships grow and change with the changing needs of the institutions that comprise them.
- Leadership usually comes from either school and college cochairs or a small steering committee that represents all the various constituents that the partnership draws together. Successful partnerships seek new members and nurture new leadership from among existing members so that the loss of a leader does not foreshadow the end of an active partnership.

The Configurations of Partnership

Partnerships vary in size. Some partnerships are large, with as many as 20 area colleges involved, offering a comprehensive range of programs for educators and students, and are well-funded by external and internal sources. However, most partnerships begin modestly, sometimes with a school-college relationship growing from a meeting between a professor and a teacher over a particular concern. In urban areas, partnerships often consist of multiple schools and colleges banded together in a consortium with a paid coordinator. Partnerships found in less densely populated areas are commonly much more modest endeavors consisting of a college and one or two local schools with a volunteer from within a participating school or college serving as coordinator. Some, but not all, partnerships develop formal contracts that specify the roles and responsibilities of each partner.

Schools also form relationships with entities other than colleges. In particular, a number of long-term, reciprocal *school-business partnerships* are active. Some business partnerships focus on the school-to-work transition made by most students who opt not to attend college, but other businesses are actively engaged in partnerships that focus on preparing the college-bound student. Businesses need not only workers, but also creative leaders. Increasingly, school-college partnerships have expanded to include business-industry and concerned others such as parents, community groups, social service providers, public libraries, and museums as equal partners. Social service providers, for example, can provide support with students' health needs, and community groups often provide tutoring. Public libraries can provide research support, and museums provide yet other research opportunities and visual displays. Sometimes these partnerships are called *community compacts*, but often they are still called school-college partnerships.

Most partnerships evaluate their programs and make changes based on analysis of the data, but too often the evaluation is based on administration of a brief survey instrument to clients at the conclusion of a program. In-depth studies, particularly longitudinal studies that track students' success, require time and money for data collection and analysis. Therefore, partnerships are likely to be thoroughly evaluated only if they are supported by ample funds from an external source such as a major foundation.

Particular programs undertaken by the partnership depend on the needs identified by partners in early discussions and later in follow-up evaluations. The following four-part framework (Wilbur & Lambert, 1991) reflects the range of such needs and classifies resulting activities. Some large, active partnerships may undertake multiple programs in all four areas:

- programs and services for educators;
- programs and services for students;
- coordination, development, and assessment of curriculum and instruction;
- and programs to mobilize, direct, and promote sharing of educational resources.

Programs and Services for Educators

Programs and services for educators consist of varied professional development activities of several types.

The *academic alliance model* is a particularly noteworthy form of professional development for educators. The academic alliance movement, a part of the larger school-college movement, was begun in 1982 by Claire Gaudiani, current president of Connecticut College, when she was a faculty member at the University of Pennsylvania. According to Louis Albert, Vice President of the American Association for Higher Education (AAHE), the power of the alliance model is demonstrated across the nation by the numbers of alliances and their sizes: AAHE estimates 700 groups exist, in almost every discipline or interdisciplinary area of study, with more than 20,000 faculty participating (L. S. Albert, personal communication, June 26, 1992).

Academic alliances are the most common and one of the most effective vehicles for revitalization of faculty because they bring together an exciting mixture of experienced and inexperienced local faculty who teach students ranging from elementary school through college. The faculty share a discipline or related disciplines and meet several times a year for self-sponsored professional development (Gaudiani & Burnett, 1985/1986). Academic alliances are amoeba-like in that they are organized simply, multiply rapidly, and are very efficient. Budgets are inexpensive, usually around $100 per year to cover the costs of refreshments and travel. Alliances exist in virtually every academic subject as well as in professional studies such as education, library science, and culinary arts. Alliances are sometimes interdisciplinary such as math-science alliances or English-social studies alliances. Some alliances are over two decades old.

The best way to understand an academic alliance is to visualize a typical meeting of an alliance in a particular discipline such as English. Picture a group of 20 to 50 English faculty from area colleges, high schools, elementary, and middle schools, who look forward to reconvening each September. Often the year will begin with each member inviting a new member to attend the first meeting of the new academic year. Student teachers and graduate students are commonly invited to join these groups as a way to introduce them to a network of colleagues. Sometimes the group meets at a local college but other times at a local school. The number and times of the meetings are set by the memberships, but often meetings are held either directly after schools are dismissed for the day or in the early evening.

In preparation for the fall meeting, the school and college cochairs arrange for meeting space and refreshments and then send out the agenda and meeting call. They act as hosts at the meeting, welcoming members at the door and ensuring that newcomers are introduced during the informal reception period that usually precedes the meeting. Meetings commonly last for around two hours. Topics in this English alliance meeting range from a brief presentation on Victorian literature given by a professor recently returned from a summer seminar at Oxford, to a summary of recent journal articles on assessment given by a high school teacher, to a brief teaching demonstration on students' cultural styles given by an elementary school teacher. Membership is voluntary. Members take responsibility for contributing to the program according to their individual expertise. If the meeting is held in the evening, the gathering may conclude with a meal and more fellowship. The group reconvenes every few months to continue their dialogue, which can range from curricular issues of general interest to other matters such as use of technology in the English classroom. If a topic is of interest to only a portion of the alliance, those persons meet separately and then report back to the larger group.

Although the alliances engage in serious efforts to promote better teaching and learning, the most endearing and enduring aspect of academic alliances is that they are fun. For example, an academic alliance of foreign language faculty in New Hampshire chose *Pizza and Pedagogy* as the name of their alliance; the name captures not only the group's concepts and practices but also its spirit. The school and college faculty meet on mutually-agreed-upon Friday evenings at a local pizza parlor, where they have dinner and share their passion for and knowledge of the teaching of foreign languages and literature, a discipline they see being eroded in too many school and college curricula.

Usually academic alliances spring up through the initiative of a faculty member or small group of faculty members. However, some states, such as West Virginia and Massachusetts, and some regional organizations, such as the New England Association of Schools and Colleges (NEASC) and the Southern Regional Education Board (SREB), have provided seed money and technical support to encourage the development of academic alliances of public colleges and the local public schools that send them students. Some regional networks of alliances also exist. For example, with a Federal Improvement for Post-Secondary Education (FIPSE) grant and the support of the College Board and the American Council on Teaching of Foreign Languages (ACTFL), the 26 local foreign language alliances in New England have formed a New England network linked electronically by e-mail. The network is engaging in research related to standards and assessment. On the national level, professional associations also sometimes support alliance development; the American Physical Society in particular has been instrumental in developing many physics alliances.

The American Association for Higher Education (AAHE) catalogues the hundreds of academic alliances and helps people interested in developing an alliance to make contact with local existing alliances for advice. (See the Appendix in this monograph to contact the AAHE.)

In addition to academic alliances, earlier models focus on professional development of either new or prospective teachers. For example, teacher recruitment and training programs have historically brought schools and departments of education at colleges together in a common effort to integrate current educational theory and research with precollegiate classroom practice. Not only new and prospective teachers, but also experienced faculty are served by school-college programs. In-service training and staff development provide experienced teachers with opportunities to update their knowledge and learn new technologies. Some partnerships also offer school-college faculty exchange programs.

Programs and Services for Students

Programs and services for students are often focused on at-risk students and increasingly on elementary or middle school students. Many of the programs provide support services such as tutoring, mentoring, or counseling. Early awareness programs are especially important because they help low-income students to see college as a possibility early enough for them to prepare. Representatives from the college meet with parents and students as early as the middle grades to discuss courses needed for college and how to secure financial aid.

Although many programs provide support for populations that are underrepresented in college, other programs provide opportunities for gifted and talented students regardless of their ethnicity. For example, some colleges either bring talented high school seniors on campus to take college-level courses or allow them to take these classes at the high school from their own teachers through the cooperation of their teachers and the college professors. Still other campuses telecast their courses to high schools. Such joint programs are given credit by the sponsoring college, so the credit is as transferable as any of the college's other credits. Project Advance, founded in 1973 at Syracuse University, is one of the oldest and most widely recognized programs that delivers college instruction to precollege students. Other programs provide enrichment activities for younger students. For example, colleges commonly provide creative activities such as either summer or after-school workshops in the arts and humanities, student leadership institutes, and access to the college library. The programs may begin as early as preschool, but they are commonly held for middle school and high school students.

"Middle Colleges" provide yet another type of service for students. Middle Colleges allow students to integrate high school and university-level studies. Some models, such as Clarkson University in Potsdam, New York, allow students who have completed their junior year of high school to enroll at the university as freshmen and live on campus. Students may use their freshman courses to satisfy graduation requirements at their home high school. Following their freshman year, students either continue on at Clarkson or enroll elsewhere. As a four-year college of liberal arts and sciences designed for students of high school age, Simon's Rock of Bard College in Great Barrington, MA, is a unique model; most students enter after completing 10th or 11th grade.

The Middle College High School of La Guardia Community College in Long Island City, NY, is a particularly well-known model that has been replicated by other institutions. The Middle College High School, located on the campus of La Guardia Community College, provides peer models, small classes, and enriched academic and support services to students who were identified by local guidance counselors as at risk of dropping out of school. The student body ranges from 460-480 students. A total of 75% of the incoming students reach their senior year, and of this group, 85% go on to higher education. These impressive figures have been consistent over 20 years (J. E. Lieberman, personal communication, May 26, 1994).

Coordination, Development, and Assessment of Curriculum and Instruction

Coordination, development, and assessment of curriculum and instruction are other functions often undertaken by school and college partners. School and college faculty discuss what students need to know in order to progress smoothly from grade to grade and on to college with appropriate challenge and as little remediation as possible. They also discuss teaching methods and new technology. Other programs focus on educational research and evaluation in areas such as student assessment.

One of the fastest growing types of coordinated curriculum is Tech Prep (Technology Preparation). Tech Prep programs bring together faculty and administrators from high schools and technical or community colleges, usually with their business partners, to agree upon the sequence of instruction for students in the last two years of high school and the first two years of college. Many models allow students to earn college credit while still in high school, thereby shortening the length of time required to earn an associate's degree. Tech Prep programs are supported by federal funds and widely accepted throughout the United States. Prior to Tech Prep programs, students who were not planning to attend college were tracked into unchallenging general education courses which had little practical application and led to no further postsecondary study. Tech Prep instruction puts students on a fast track to a degree with the option of transferring to a four-year institution with which the community or technical college has consummated an *articulation agreement*, (i.e., the types of courses that, if successfully completed, guarantee admission). These arrangements are known as 2+2+2 *programs*, signifying two years of high school vocational study followed by two years at a community or technical college and then two years at a cooperating four-year institution. (See in this monograph Patricia Neri's and Cheryl Serra's "The Rhode Island Tech Prep Association Degree Program"; see also the Appendix for the address of the National Center for Academic Achievement and Transfer at the American Council of Education for publications and technical assistance.)

Programs to Mobilize, Direct, and Promote Sharing of Educational Resources

Programs to mobilize, direct, and promote sharing of educational resources may be aimed at reform and restructuring of grades "K–16." According to the latest national survey of school-college partnerships, restructuring is one of the fastest growing areas of collaboration (F. P. Wilbur, personal communication, May 25, 1994). Many schools are changing their structure by having, for instance, principals more likely to make decisions that might have been made formerly by a superintendent of schools. Increasingly, school-college educators are realizing that the changes in schools mean that colleges and related organizations also need to change in response. For example, portfolio assessment is becoming more common in schools. In a typical English class that uses portfolio assessment as a strategy, students accumulate and revise their essays in a portfolio throughout a course. Teachers and students periodically review the portfolio, noting the progression of learning and skill over time. At the end of the course, students each pick several essays to revise as examples of their best work. The course grade is based on this showcasing of the culmination of their learning. According to Claudia Gentile of the National Assessment of Educational Progress, several states have been experimenting with the use of writing portfolios for state assessment projects, and the National Assessment of Educational Progress uses writing portfolios as part of its writing assessment (personal communication, July 7, 1994).

Some college professors have also adopted portfolio assessment of students' work, but most colleges have not considered the impact of increasing numbers of entering students who have become used to this type of assessment of their learning. The University of Maine System and its school partners are notable exceptions. As the result of a meeting called in 1993 by the State Board of Education, the universities and private colleges in attendance developed a goal statement: "Develop an alliance and compact of colleges and universities and high schools in Maine to explore alternative means of demonstrating knowledge and skills for admission to colleges and universities." The University of

Maine System further stated, "In partnership with selected Maine high schools we will develop and pilot an admissions procedure that relies on alternatives to traditional grades and SAT scores such as portfolios, juried exhibitions, and demonstrations of student work" (Deans and Directors of Education, 1994). In addition, the Coalition of Essential Schools, housed at Brown University, as of March 1994, identified 22 colleges and universities across the nation that welcome applications from schools that encourage engagement of students in independent thinking and serious work of the sort represented in portfolios. In March 1992, the National Association of College Admissions Counselors endorsed this effort and pledged its support to restructured schools (Camilla Green, Brown University, personal communication, September 20, 1995).

Other types of resource-sharing programs include tutoring and volunteer programs in which, for example, senior citizens or college students might volunteer to tutor or mentor students in a school. Still other partnerships share human resources (faculty as speakers, for example) or order supplies or equipment in larger quantities through the consortium to save money.

Adopt-a-School is a particular type of resource-sharing program in which the college provides guest speakers, student tutors, and volunteers and extends invitations to school faculty to participate in activities on campus. Businesses often are involved also. Although Adopt-a-School is a long-standing model, its popularity has waned somewhat because it is not a true partnership. As the name of the model implies, the college or business tends to *adopt* the school, thereby playing a paternalistic role that is not in keeping with a collaboration of peers. In a true partnership, each partner gives and receives from the relationship. Participants *collaborate* rather than simply *cooperate.*

Arthur Greenberg (1991), author of an ASHE-ERIC Higher Education Report on high school-college partnerships, draws a distinction between *collaboration* and *cooperation.* Collaboration is a subset of *articulation,* for which various definitions focus "on a concern for smooth, unimpeded progress between successive institutional levels" (p. 13). True articulation should result in what is often referred to as a *seamless web* with students passing easily from grade to grade, prepared affectively and intellectually for the expectations of the new teacher in each new grade from kindergarten through graduate school.

Cooperation, in contrast to collaboration and articulation, implies a much more passive relationship than is characteristic of a partnership. Clark (1988) feels *collaboration* implies shared authority and responsibility, whereas *cooperation* implies more autonomy on the part of the parties involved (p. 38). *Networks* are relatively loosely organized groups that *cooperate,* for example, by sharing information. School-college networks are not partnerships *per se,* but they are a part of the school-college movement because they help to break down the communication barriers between schools and colleges and provide important services to precollegiate students. Colleges that work with students from schools over large geographic areas do not usually form true collaborative relationships with these schools; however, they cooperate with schools in providing programs for their students, and they are generally considered a part of the school-college movement that is affecting the educational pipeline. (See in this monograph JoAnn Moody's, "Academic Support Systems: Mentoring Underrepresented Students of Color," a discussion of school-college networks for minority students.)

Many partnerships use some other term to describe themselves. Clark (1988) says, "Authors speak of *partnerships, collaborations, consortiums, networks, clusters, inter-organizational agreements* (*IOAs*), *collectives,* and *cooperatives,* frequently without definition and often without distinguishing their chosen descriptor from other possible terms" (p. 33). Not only authors but also grassroots participants in the movement use the terms interchangeably. Some groups have even coined a new term by using the adjective *collaborative* as a noun in naming their organizations, for example, the Worcester Polytechnic Institute School-College Collaborative. As Clark (1988) acknowledged following an exhaustive discussion of various definitions, a partnership must be considered "in terms of its operating concepts and practices, not its title" (p. 41). Maeroff (1983), in a report on school and college partnerships for the Carnegie Foundation for the Advancement of Teaching, moved beyond definitions to capture the essence of school-college collaboration. Maeroff (1983) summarized five commandments for educational collaboration: a shared, common agenda; a spirit of collaboration; a focus on one or two specific goals; reward for participants; and a focus on activities, not a preoccupation with budgets and bureaucracy (p. 5). Although more than a decade old, Maeroff's commandments continue to focus on the heart of collaboration because they move beyond rhetoric and red tape. His commandments revolve around the human needs of any relationship.

Chapter 4

The Reciprocal Nature of School-College Partnerships

One of the needs of any relationship is mutual respect. In order to feel like partners, all members of a partnership must have opportunities to give and to receive. Benefits and contributions vary greatly, depending on the needs and resources of each partner. However, the following contributions and benefits are commonly cited during discussions among collaborators.

What Do Schools Commonly Contribute?

- Schools offer teachers as adjunct faculty in developmental, remedial, or other entry-level courses, and in areas such as education, they may serve as co-teachers.
- Schools supply students for undergraduate classes and teachers as students in graduate-level classes.
- Schools offer the pedagogical expertise of their teachers. Most college professors have not studied how to teach; they simply teach as they recall being taught. Professors often learn a great deal from teachers who must make their subjects engaging, even for reluctant learners.
- Schools are a source of students and teachers for the purpose of educational research and practice teaching. This contribution dates back to early interactions between schools and colleges, but is no longer the most common relationship because increasingly partnership activities are undertaken by faculty outside the schools of education.
- The talents of precollegiate students are a contribution schools make. Students commonly produce art or music for gatherings held by partners.
- Schools provide audiences for many campus activities, especially valuable for activities such as student theater productions that may attract only small on-campus audiences.
- Schools may provide funding opportunities. Schools sometimes have access to either local-, state-, or federally-supported staff development funds that can be used by the school-college partnership for professional development of school teachers. Among federal funds to schools, Chapter I is of particular note. This federal fund, authorized by Title I of the Elementary and Secondary Education Act, helps schools to meet the special needs of educationally deprived children from low-income families. (Note in the Appendix the American Association for Higher Education for a free summary (1992) of *Making Schools Work For Children in Poverty: A New Framework*, prepared by the Commission on Chapter I.) Furthermore, an increasing number of foundations are calling for school-college proposals that require collaboration with a school, thereby providing colleges with additional funding opportunities.

What Do Colleges Often Contribute?

- Colleges contribute subject matter expertise in very specialized areas from faculty who serve as either speakers or as exchange teachers for a year.
- Colleges may have specialized equipment that can be loaned to a school.
- Colleges can provide access to electronic mail for school partners and access to libraries, athletic facilities, and events on campus such as plays and sports competitions.
- Colleges establish clear expectations for entering freshmen and the promise of continuous academic and social support and intervention after students enter college.
- Colleges establish programs that provide academic and affective support for precollegiate students.
- Colleges provide clerical support for the partnership.
- The monies for scholarships for local students who have met criteria such as good attendance and grades may be provided by colleges.
- Colleges provide counseling regarding college such as information about financial aid.
- Colleges provide college students as mentors for younger students.
- Campus buildings provide meeting space for partnerships activities.
- Colleges recognize and honor school teachers: Princeton University awards honorary degrees to teachers at graduation; Brown University recognizes teachers who are the parents of graduating seniors.

What Do Businesses, Industry, and Other Community Organizations Often Contribute to a Partnership?

- Businesses bring a knowledge of organizational development through strategic planning.
- Business provides speakers in math, science, or business classes, financial or management expertise, or donations of equipment or funds. Business people often act as mentors to students and sometimes provide internships or job shadowing.
- Businesses assist with the school-to-work transition as well as with curriculum revision at the college level in disciplines that may lead to business careers.
- Parent groups provide important support and encouragement at home as well as high expectations and standards for children.
- Social service organizations can contribute support in meeting the health needs of children.
- Public libraries and museums are sources of information and hands-on displays.

Benefits for Schools

If a partnership is properly coordinated, each partner not only benefits, but also contributes resources, many of which are readily at hand. In many cases, no direct costs are incurred by the contributions being made.

- Schools gain assistance in providing social services for students. Parents can support schools in their effort to meet the social needs of students. School administrators often feel overwhelmed by the students' need for scores of social services, some of which are mandated by legislation. Social service organizations can provide some much needed assistance such as screening for health problems or psychological counseling. For example, the Family Life and Sex Education Program of the Children's Aid Society, a social service agency in New York City, "aims to help inner-city teenage boys and girls to get a life before they go about conceiving one" (Lacayo, 1994). The program includes sex education and family planning, but focuses on helping students to develop skills that will lead to stable jobs and lives. Graduates of the program are guaranteed admission to Hunter College with full tuition (Lacayo, 1994).

- Supportive allies within the community are established. Schools are increasingly being held accountable for the success of their students, but an involved community that understands a school's impediments to success is more likely to be supportive and less likely to attack the efforts of teachers and administrators when the school's data, such as standardized test scores, are not favorable.
- Schools gain the opportunity to determine what colleges and employers expect of high school graduates.
- Schools gain professional development opportunities for faculty.
- Schools gain special programs to prepare students for college.
- Students and teachers are given access to specialized equipment that belongs to colleges and businesses.
- School teachers and students receive assistance in content areas from college-level specialists.
- Schools gain access to technical advice not usually available. For example, faculty from the Occupational Safety and Health Administration (OSHA) department of a local college may discuss with school faculty and administrators the safe use of chemicals in laboratories.

Benefits to Colleges and Universities

- An improved school-to-college pipeline delivers a culturally diverse group of first-year students who are better prepared academically, socially, and psychologically. Increased access to college and improved retention are natural by-products of most educational partnerships whether or not they are explicit goals.
- College faculty gain the opportunity to learn from kindergarten through twelfth grade educators, especially regarding pedagogy. Christian Jernstedt, a psychology professor at Dartmouth College and a member of an 18-year-old partnership between Dartmouth and the Dresden School District, feels that elementary school teachers have more to offer their college counterparts than is readily apparent. Jernstadt (1991) says, "Our elementary school teachers have much to offer our college teachers, and our college teachers have much to offer our elementary teachers. For example, a fifth-grade teacher lectures in college courses on the use of the Greek classics and storytelling as teaching techniques, while in high school social studies classrooms the college physicians and psychologists lecture on learning and the brain" (p. 5).

  Opportunities to talk about pedagogy are particularly important for college faculty, most of whom have received no instruction or training regarding the teaching of their subject matter. Young faculty, unless they have the benefit of a mentor, sometimes have difficulties with classroom management and other instructional matters, but are reluctant to discuss their own inadequacies with faculty who will later sit as peers in judgment of their qualifications for promotion and tenure. In contrast, secondary school colleagues are a safe and knowledgeable audience with whom young professors can discuss their concerns and craft solutions to their pedagogical problems. Improving education by learning from each other may well be the heartbeat that sustains most partnerships, some of which are over 20 years old.

- Improved town-campus relations and positive press coverage is gained. Not only public schools but also colleges have been bruised by verbal assaults from state and federal governments as well as from the general public as national scores on standardized tests have declined. The reputation of the postsecondary community is enhanced when it joins with local schools as well as with segments of the public that have been criticizing education in a vigorous effort to improve education from preschool through graduate school.

- High quality local schools are an asset for colleges and universities seeking to recruit new professors and administrators who have school-age offspring to educate.

- Secondary school teachers can serve as advisors on revision of introductory-level college curriculum. For example, according to Mary Alice Wilson, the Five College/Public School Partnership of western Massachusetts, with funding from the Pew Charitable Trusts, hired secondary school math and science teachers as advisors in the revision of introductory-level math and science curriculum at the partnership's member colleges (personal correspondence, March 9, 1995).

Benefits for Business, Industry, and Community Groups

- Community and business groups gain the opportunity to influence the preparation of students who may later apply for jobs in the community. Because students will eventually become workers who pay the social security of today's workers, Americans all have a stake in preparing workers for the new technological, global economy that is emerging.

- Business, industry, and community groups develop a means of contributing to the well-being of the community. A strong community attracts new employees and homeowners. An economically strong community is able to patronize local businesses and community groups such as the local theater. An economically strong community is also willing and able to support local schools through tax dollars. Conversely, depressed commercial and residential real estate values, faltering local businesses, and a retired populace often provide schools with too few dollars and too few non-monetary forms of support. Everyone benefits from a strong community.

- Partnerships make available facilities that small businesses may use such as a gym, auditorium, computer lab or television studios at some schools.

- Business and industry personnel may benefit from employee training programs that school teachers can offer such as refresher courses in writing or mathematics, as long as such courses are not in competition with courses offered by partner colleges.

Chapter 5

Present Leaders in the School-College Movement

In the 1990s, local partnerships and supporting professional networks can be found all over the United States. According to a national data base developed by Franklin Wilbur and Leo Lambert at Syracuse University, and continually updated by Wilbur, every state is actively involved in school-college partnerships. Wilbur and Lambert (1994) received over 2,000 responses to a survey of school-college partnerships sent to chief academic officers at all American colleges and universities and all known directors of school-college partnerships. The Middle States and the Atlantic Coast are particularly active, but even the least active regions — the Pacific and Appalachian regions — were represented by a response rate of 30-35%. The number of partnerships begun since 1980 has grown dramatically. Wilbur feels that the national survey confirms that the school-college movement is building momentum (personal correspondence, May 25, 1994). (For further statistics regarding the movement, see Wilbur and Lambert, 1995.)

Another testimonial to the growth of the movement is the proliferation of publications in the field. According to Arthur Greenberg (1991), author of an ASHE-ERIC Higher Education Report on high school-college partnerships, a computer search of periodicals in the ERIC system using the phrase "college-school cooperation" produced more than 1,000 references to entries in periodicals produced since 1976 (p. 2). A more recent ASHE-ERIC search, again using the phrase "college-school cooperation," produced 5,363 entries dating from 1966 through 1994. In just the single month of January 1995, twelve new ASHE-ERIC files were added to the data base. Publications in the field are clearly burgeoning (Carriuolo, ASHE-ERIC search, 1995).

Originally, partnerships tended to focus on high schools and colleges, but increasingly colleges are also recognizing the need to work with pre-kindergarten, elementary and middle school teachers and administrators because the path to college begins early in a student's education, beginning, possibly, before birth. Often, in addition to business and industry, social service providers and community groups such as the local parent-teacher organization are participants in the local partnership. However, equally important are associations that support local partnerships through information-sharing, technical support, and occasionally mini-grants. Information is often disseminated through publications and increasingly through e-mail. However, conferences are an important vehicle for providing members of local partnerships with a chance to meet and exchange ideas. Membership associations, discipline-based professional associations, and state-level departments of education and higher education support school-college collaboration. Many of these organizations and their member institutions have attracted significant funding from corporations and foundations. (See the Appendix of this monograph for a listing of some organizations and the types of support they offer.)

Of particular note, the American Association for Higher Education (AAHE) sponsors a variety of school-college publications and activities, including the only annual national conference specifically devoted to school-college partnerships. The conference was first held in 1990 with the College Board as a cosponsor. The roll call of past and/or current cosponsors of this annual conference hints at the depth and breadth of support across the nation:

- American Association for the Advancement of Science (AAAS);
- American Association of Colleges of Teacher Education (AACTE);
- California Academic Partnership Program (CAPP);
- Children's Defense Fund (CDF);
- Council for Aid to Education (CAE);
- Council of Chief State School Officers (CCSSO);
- Education Commission of the States (ECS);
- National Association of Secondary School Principals (NASSP);
- National Council of Education Opportunity Associations (NCEOA);
- National Society for Experiential Education (NSEE);
- Yale-New Haven Teachers Institute;
- Center for Research and Information on School-College Partnerships, Syracuse University;
- Commission on Chapter 1;
- Consortium for Policy Research in Education, Rutgers University;
- Middle College High School Consortium;
- New England Association of Schools and Colleges;
- Woodrow Wilson National Fellowship Foundation.

(For further information about organizations that support school-college collaboration, see the Appendix of this monograph.)

The AAHE conference attracts 500-700 collaborators annually. Both AAHE and the College Board have also provided funding to support school-college collaboration and the development of school-college models across the country. (In this monograph, see also "The College Board: Lessons from Two Decades of School-College Collaboration" by Donald Stewart, and "The American Association for Higher Education: Community Compacts for Student Success" by Nevin Brown.)

Although AAHE sponsors the only national school-college conference, local and regional conferences of school-college collaborators are common. In addition to representatives from business and community groups and funders of partnerships, the conferences attract a variety of representatives from schools and colleges: upper-level administrators, faculty, (college) admission staff and student services staff. Attendees also include coordinators of school-college partnerships. The coordinator may be a full-time employee of the consortium or a faculty member or administrator from one of the collaborating institutions who coordinates the partnership part-time either as a volunteer or for a stipend or released time.

Discussions among leaders in the school-college movement usually focus on public schools, but independent schools also contribute to the school-to-college pipeline, and they are actively interested in working collaboratively with colleges and other schools. The changing American population has greatly affected public schools and colleges, and independent schools have, in some cases, been leaders in embracing the changing population. Independent schools have a great deal to share with their school and college counterparts and should not be overlooked in collaborative arrangements.

Ascher (1987) cites research showing that "the standardized achievement test scores of Black students in private schools are higher than those of Black public school students, and that, at least with younger students, many behind-grade-level transferees from public to private schools make up the lost grade within a year" (p. 36). Ascher also cites Coleman and Hoffer, who have found that Catholic schools have a lower drop-out rate for African-American and Hispanic students, including those who come from disadvantaged homes (p. 36). Parochial schools have been successful in attracting major funding and other types of support for their work with at-risk students. For example, Big Shoulders is a partnership between Chicago's archdiocesan school system of nearly 142,000 inner-city students and the business community. Business has contributed $36 million to the partnership since its creation in 1986. Funders like to see results and this program provides results: 75% of the students served by Big Shoulders attend college or some other form of postsecondary education (Reardon, 1994).

Nonsectarian independent schools are also active collaborators. The Woods Hole Science and Technology Education Partnership brings together the Falmouth Academy (an independent school), public schools, the Sea Education Association, the Marine Biological Laboratory, the U.S. Geological Survey, the Northeast Fisheries Science Center of the National Marine Fisheries Service, engineering firms, retired scientists, science writers, and science educators. The three-year-old partnership evaluates curricula, engages in teacher training, sponsors educational programs for parents, teachers, and scientists, exchanges surplus equipment, and publishes a newsletter (Buxton, 1994). The headmaster of Falmouth Academy, the independent school involved in the partnership, serves as a vocal advocate of this many-faceted partnership. Each type of institution, public or independent, has a unique perspective to contribute to redesigning the educational pipeline.

The active support of college presidents, school superintendents, and school heads is vital to the success of partnerships. Upper-level administrators have the political and financial resources that are necessary for initiating and sustaining change. Sometimes they are also the visionaries who conceive of exciting joint school-college programs. For example, at the Juilliard School of Music in New York, the Music Advancement Program is the brainchild of Joseph Polisi, the President of Juilliard. The program allows Native American, African-American and Hispanic students to compete for scholarships that allow them to study at Juilliard on Saturdays. The program grew from an interest in preparing more minority youngsters so that they would qualify for admission to Juilliard following graduation from high school (Hewitt & Danowski, 1994). (See also in this monograph, "Music Plus: Creating an Academic and Musical Outreach Program for Urban School Students," by Victor Ellsworth, for a discussion of a music and academic outreach program at Bowling Green State University in Ohio.)

Although upper-level administrators are important to the school-college movement, grassroots faculty and staff carry out the day-to-day activities. The grassroots leaders of the movement elude categorization. They do not share any particular job title, and for many of them, collaboration is not a part of their job descriptions. Even the coordinators of school-college partnerships, although they are clearly charged with undertaking collaboration, may be either faculty members, academic administrators, or staff from admissions/student services. In the case of multi-institution consortia, the coordinator may be hired by the consortium and report to a steering committee with representatives from each member institution. In this case, the coordinator may be housed on a neutral site, not on any particular campus. (See in this book of this monograph the chapter "Forging School-College Partnerships," for suggestions about how to locate the person in charge of school-college collaboration for a particular college.)

Chapter 6

Impediments to School-College Collaboration

Although schools and colleges provide rewards to collaborators, impediments to collaboration do exist. Collaborators commonly cite deficiencies in the school and college reward systems, communication difficulties and differences in the cultures of schools and colleges, uncertain funding of collaborative efforts, frustrating hierarchies and bureaucracies, and diminished levels of commitment linked to a change in leadership.

On school and college campuses, the rewards that are offered are not necessarily the ones most valued by participants in school-college partnerships and by prospective participants. For example, many colleges, particularly public institutions, include a statement regarding service to the community as part of their missions, yet too few reward this kind of participation via school-college collaboration by providing credit toward promotion or tenure. Within schools, even though school-based management is becoming more popular, school teachers usually have even less opportunity than their college counterparts to discuss the types of rewards that they view as fair for their active involvement in collaboration with colleges. School-college collaboration is hard work that requires participants to change not only curriculum but also ingrained attitudes and teaching methods. Rewards should be commensurate with the effort and the results.

Collaboration is further hampered by the differences in the cultures of schools and colleges. Gomez (1994) notes, "The cultures of higher education and public schools are different in almost every way — sources of institutional support are different, so are decision-making processes and modes of professional conduct" (p. 42). Higher education faculty are accustomed to governing through a faculty senate or council. In contrast, teachers are often relatively unaccustomed to making decisions on issues such as curriculum, budgets, and institutional management. Teachers also have much less freedom to return telephone calls or attend meetings outside their institutions. Consequently, they may appear to their higher education counterparts to be unresponsive. Furthermore, different uses of the same terminology can make initial conversations difficult. For example, if a student is *retained* in fifth grade, the connotation of the term is negative; the child has failed. In contrast, college educators speak of retention at the college level in a positive way: the student is being *retained* to the point of graduation. Even institutional expectations regarding faculty development differ on school and college campuses. College faculty expect to be responsible for their own professional development, which usually includes publishing and researching. College faculty expect time for reading, writing, and reflection to be built into their work days. In sharp contrast, professional development for school faculty is more likely to mean formal study during the summer or in the evenings, often under the auspices of higher education faculty.

Academe's traditional hierarchy, with elementary school teachers at the base and graduate school faculty at the pinnacle, also serves as an impediment to collaboration between equal partners. School-college collaboration works to establish an equality among partners. School and college faculty jointly plan their partnership's activities and learn from each other. Furthermore, experienced college collaborators do not use their academic titles when they meet with their school counterparts. Although some school teachers have terminal degrees, many do not. The title *doctor* reinforces the differences, not the similarities between school and college faculty and administrators.

The uncertainty of steady funding is yet another impediment for many otherwise fine partnerships. Many partnerships are dependent, at least in part, on grants. Most funders will only fund a project for a limited number of years. Consequently, partnerships are eventually faced with either seeking new funders or assuming the costs of the partnership internally. In difficult economic times, when soft money disappears, hard decisions have to be made by the member institutions. Sometimes programs are cut, but other times entire partnerships dissolve.

Lack of coordination of various local school-college initiatives is yet another problem. Large universities commonly sponsor over 100 school-college programs, yet sometimes the persons heading these separate initiatives know little of each other's efforts. Furthermore, separate higher education institutions in the same locale sometimes work with the same school, but are unaware of each other's efforts. Urban schools, in particular, are often approached by a number of colleges that may not be working together. The results are well-intentioned, but chaotic. Schools are understandably wary about becoming involved in a series of partnerships, some of which have overlapping purposes. Separate partners trying to work with a school should all be brought to the same table so that they collaborate rather than compete with each other. (See in this monograph Nevin Brown's "The American Association for Higher Education: Community Compacts for Student Success," for a discussion of coordinated urban efforts.)

Even when a partnership is clearly coordinated, an outsider often has trouble locating the coordinator. The coordinator on a college campus may report to admissions, students services, academic affairs, or, in the case of a multiple institution partnership, may report to a steering committee composed of representatives of several institutions. The same is true for persons responsible for the retention of students; the title of the person in charge and the reporting structure vary from campus to campus. Furthermore, those responsible for school-college collaboration and those responsible for students' retention are usually not the same and often have no knowledge of each other's efforts. If these two groups begin to collaborate as part of the continuing growth of the school-college movement, the result could be less duplication of efforts and more likelihood of students' success.

Changes in leadership are also disruptive and sometimes fatal for partnerships. Successful, long-standing partnerships must continually nurture new leadership from within the organization. For example, the school and college cochairs of an academic alliance always encourage others to think of assuming their positions for the coming year. Partnerships are also affected by changes in the chief executive officers of the educational institutions, or business-industry and community groups, involved in the partnership. For example, a superintendent of schools may enthusiastically begin a partnership with a local college, but the average term of service for a superintendent is usually only several years. The new superintendent may not wish to support his predecessor's initiatives for any number of reasons. Changes in leadership at the school and at the college levels through resignation, death, or retirement, or temporary leaves such as sabbaticals or fellowships, can serve to undermine collaboration within the institution and across institutions.

At the grassroots level, collaboration also suffers when decisions are made for political reasons or because collaboration decreases the size of someone's turf. For example, some partnerships pool funds to deliver services more efficiently, but more efficient services may mean that some jobs are diminished in scope or power. Collaboration requires sharing, not hoarding, power and resources.

Chapter 7

How Partnerships Can Facilitate K–12 Students' Success

Barriers to student success are varied and often difficult to predict and overcome. Partnerships that focus on moving greater numbers of underrepresented students through the educational pipeline to college try to identify, address, and remove the barriers that students face. (Book II of this monograph describes the ways some partnerships grapple with these barriers.)

The discussion here will focus on barriers, particularly economic and social barriers, that students face in the school segment of the educational pipeline. The number of traditional-age students who are available to enter colleges is not only a reflection of dwindling birth rates following the baby boom of the 1940s, but also a reflection of the continuous loss of students from throughout the pipeline. Curriculum, testing, and standards for admission to college have been long-standing concerns dating back to the late 1800s. However, a relatively new concern is poverty.

Poverty affects children in many subtle and not so subtle ways. Health problems, frequent movement to a new school-college system, teenage pregnancies, learning disabilities, second-language interference, cultural differences, lack of appropriate parental and school support, and drugs and violence associated with urban streets are some of the barriers that block the passage of these children to college. Low-income students from racial minority groups (which are rapidly becoming majorities in many parts of the country) face the added barrier of racism. However, poverty is a much stronger deterrent to academic success than is race alone (H. Hodgkinson as cited in Duckett, 1988).

Poverty increasingly diminishes a student's chance of success with each year of formal education, and poverty is enveloping a growing number of America's children. In fact, 40% of the poor are children, and 50% of the children under age five will be raised by a single parent before they reach the age of 18 (Duckett, 1988). Every day, 40 teenage mothers give birth to their third child; these 40 children, who tend to be premature, have increased chances of health problems and learning disabilities (Duckett, 1988). Low-income parents, who are often themselves either under-educated or uneducated, are not prepared to help their children leave poverty through education. They are preoccupied with basic needs and often have little sense of long-term goals such as a college education for their children. Low-income parents cannot provide the supports that children in middle- and upper-income families enjoy. When parents work for per-hour wages, they cannot leave their jobs to attend parent-teacher conferences. If their language skills are weak, they cannot communicate effectively with the school and serve as advocates for their children. They cannot afford enrichment activities, reading materials, or space in their home for a child to find a quiet place to study. They do not have enough education to provide help with homework. Furthermore, although some ethnic groups value education, other cultures do not necessarily view education as a means of improving life and, in fact, adopt a hostile view. Low-income parents usually have neither information about nor experience with higher education so they cannot be expected to advocate education.

In recognition of the needs of children from low-income homes, an increasing number of school-college partnerships are turning their attention to a child's earliest years and educating not only children but also their parents and other child care providers. For example, in the Boston University/Chelsea Partnership, local child care providers, some of whom are parents themselves, have received computers for their homes through an IBM grant as part of the Boston University/Chelsea IBM High Technology Home Learning Centers Project. Begun in 1991, the project provides training and support for 12 family day care providers. The computer network links the home-care providers with child-care agencies in a local health center, the Chelsea public schools and the Education Department of Boston University. The project is the first computer-linked early childhood project of its kind in America. Not only the children but also the adults are given aspirations for a better life through education. Some child care providers participating in the program have already earned high school equivalencies and are enrolling in postsecondary education (Staff, Boston University press release, 1992). Creative early intervention programs such as the one in Chelsea have built upon the long-standing success of Project Head Start in nurturing the early intellectual and social development of youngsters, thereby preparing them for later success in elementary school. If colleges welcome students from all economic and cultural backgrounds, colleges need to help parents, guardians, child care providers, and teachers create an environment that is healthy, emotionally supportive, and intellectually stimulating.

Outside of the home, children experience other impediments to academic success. Street violence is a particularly pernicious barrier for students because it sometimes extinguishes not only a student's chances for academic success but also the student's very life. Delbert S. Elliot, a leading expert on youth violence who recently (via a Carnegie Corporation grant) studied violence among adolescents, says that "our children and teenagers are the most frequent victims of violence" (Russell, 1994, p. 2). A 1993 study of a representative sample of 2,508 students at 96 public and private elementary, middle, and senior high schools, conducted by Louis Harris for Harvard University's School of Public Health, found that roughly one in ten teenagers between the ages of 10 and 19 has fired a gun at someone or been shot at, and about two in five of these students say they know someone who has been killed or wounded by gunfire (Russell, 1994).

Youngsters from violent neighborhoods and schools report numbness and fear. They focus on survival. Good students, in particular, are isolated and harassed by their peers. In one inner-city high school a gang member named Head says of honor students, "Everyone knows they're trying to be White, get ahead in the White man's world. In a way, that's a little bit of disrespect to the rest of us" (Suskind, 1994). Head's inner-city high school had a class of 836 sophomores in September 1993, but a class of only 210 seniors. The assistant principal reports that the school doesn't know much about where the dropouts go (Suskind, 1994).

Students like Head view drugs and crime, not education, as the way to a better life. One student from a historically Black college in a survey of African-American and White students' perceptions of their college campuses, expressed anguish over children like Head: "It is important for Blacks to learn about the importance of education, and [the institution] isn't providing the necessary tactics to recruit the younger, soon-to-be college students who may be led astray by drugs, unawareness, and indetermination" (Abraham & Jacobs, 1990, p. 96). On a national level, African-American males begin to show a clear decline on mathematics and reading tests by grade four, followed by disinterest, with some dropping out before even reaching high school (Garibaldi, 1992). Yet, intervention does make a difference. One African-American college student did not rely on a college to save his younger brother from the streets. Bilal Karriem, a graduate student at Pennsylvania State University, took custody of his twelve-year-old brother and enrolled him in State College Junior High School, a nearby public school. His brother now earns As and Bs. The boy had previously earned straight Fs in his neighborhood public school in Camden, NJ (Collinson, 1992, p. A29). Other students seek scholarships to independent secondary schools in order to escape the notorious violence of inner-city schools.

The Carnegie Corporation has sponsored a study of the long-term development of violence in children and its effect on their futures (Russell, winter 1994). Colleges, shocked by such studies and by reports in local newspapers, are increasingly reaching out to younger students. For example, Kids Incorporated is a summer program that brings 25 students from the Rafael Hernandez Bilingual School, a public elementary school in Roxbury, MA, to Bentley College. Students explore the campus and begin a business enterprise. Parents are also invited to campus for an evening function, and the entire family is invited for a family day. Equally important, students have access to the physical education center, the campus center, the library, and computer labs. They are given information about college planning, participate in workshops sponsored by the Bentley faculty and by corporate representatives, and are encouraged to use the resources of the campus as an alternative to finding amusement and peer interaction on the street (Carriuolo, 1993).

Although colleges or community groups such as churches often act as hosts for after-school programs in high-crime areas, increasingly schools are sponsoring programs after regular school hours with the support of others who provide funding or supervision for the programs. The Community Schools Program is one such program. The program has been successful in various locations. In Missouri, 675 public schools provide after-school programs with the help of 6,000 volunteers. In New Jersey, schools have collaborated with groups such as Boys and Girls Clubs to provide mentoring. In New York City, so-called Beacon Schools provide a safe haven for students after school (Reno, Bradley, & Danforth, 1994).

Although the urban poor have been the focus of many school-college initiatives, the rural poor are less visible but also equally deserving of special attention. Rural initiatives have been launched in the South by the Ford Foundation and by the General Electric Foundation and in New England by the New England Association of Schools and Colleges, but generally poor children in rural areas enjoy the services of fewer school-college programs than poor children in decaying cities. According to Faye Johnson, director of Fiscal Services and Director of Special Projects for Dos Palos High School in California, "Rural schools do not have a critical mass of either teachers or students: in a school of only six hundred students, several dozen students representing a particular racial minority are not likely to attract outside attention and concern" (Carriuolo, 1992, p. 19). With too few dollars to support programs, the most visibly needy often attract the most support. Yet, rural colleges engage in partnerships with as many local schools as possible. (See in this monograph Jim Kowalsky's discussion, "The Rural Alaska Honors Institute: Moving Native Americans Through the Academic Pipeline," for a description of the outreach to Native American youngsters through the University of Alaska.)

Language is yet another barrier to the success of poor children that is addressed by partnerships. Many of the 15 million immigrants in the U.S. are children who cannot speak English. Furthermore, many non-Anglo children who are already in school do not speak English fluently enough to perform well (Duckett, 1988). Schools struggle with the question of how best to help these students. Not all bilingual teachers are equally fluent in the native language and in English, which raises questions regarding the quality of instruction for these students. As with any group that is separated from the mainstream, bilingual students and their teachers need special support that colleges and other educational partners can provide. (See in this monograph A. Patricia Jaysane's "Transitions: Building an Urban K–16 Continuum for Linguistic Minorities," about a partnership between Lawrence High School and Merrimack College that serves students in a transitional bilingual education program.)

Cultural differences and their effect on student learning are related issues discussed by school and college educators intent on hammering out a better pipeline. Schools and colleges do not necessarily share research with each other, so a discussion of research and strategies undertaken by schools and by colleges is mutually beneficial. For example, Philip Uri Treisman, while a mathematics professor at the University of California - Berkeley, studied the positive effects of cooperative learning among Asian-American students and taught these techniques to African-American, Hispanic, and White students. Treisman has also learned through his research that basic mathematical operations need not be remediated repeatedly. His students learned the basic mathematical operations as part of solving more challenging problems about which they can feel good (Watkins, 1989) With over 125 colleges emulating Treisman's methods (Wheeler, 1992), his research is known to many college mathematicians and college-level retention staff, but to fewer at the school level.

Although most teachers could learn from Treisman, teachers also have expertise to share with college professors, many of whom simply teach as they were taught. College professors usually have neither taken courses in education nor have they necessarily enjoyed the benefits of experienced mentors who can teach good classroom practices and examine with them the learning process. Consequently, many college professors are baffled by the needs of an increasingly diverse student body with whom school teachers have a great deal of experience (Noe, 1986). Therefore, another benefit of school-college interaction is the opportunity for successful teachers to share with professors teaching techniques that they have used with culturally diverse students. For example, Jaime Escalante, the former Garfield High School Teacher in Los Angeles, attracted not only kudos from the educational community but also national attention for his ability to teach higher mathematics to low-income, predominately Hispanic students (Matthews, 1992). Through collaboration of local college and school faculty in either summer workshops or in academic alliances, faculty who are Uri Treisman's and Jaime Escalante's lesser known counterparts in multicultural urban, suburban, and rural classrooms, can share their expertise in teaching culturally diverse students. Jaime Escalante's students were successful because he played the multiple roles of teacher, counselor, and surrogate parent. School-college partnerships can provide faculty and staff who may help overburdened teachers assume some of these varied roles.

Whether or not low-income students benefit from fine teaching depends in part on the school and its financial resources. Inexperienced teachers, long-term substitute teachers, decaying buildings, and lack of counseling are common impediments for children attending school in impoverished urban areas. Such school districts attract a few fine teachers, but many choose to go where the pay and working conditions are better. For example, in a survey of elementary school teachers in San Bernadino, CA, the researcher found that "although 60% of the students were Black and Hispanic, 72% of the teachers were Caucasian; 17% knew 'very few' of their students' parents; and 37% reported no cultural awareness workshops attended during the last three years. Forty-three percent were dissatisfied with their preparedness for working with the culturally diverse student population; however, interestingly, only 20% felt workshops would be beneficial" (Henry, 1994, p. 9).

Impoverished school districts also lack a sufficient number of counselors. Counselors must ensure that students take appropriate courses for college and take the entrance examinations on time. Counseling is particularly important as children move from elementary to middle to high school and are faced with conflicting cultures, new policies, new rules, and new expectations. Although partnership efforts range from kindergarten through high school, middle schools (grades 4-6) are one point at which intervention, particularly counseling, seems to be especially effective. For example, at Middlesex Community College in Massachusetts, counselors work with middle-school children in Lowell, MA. The children are taken on field trips to the city to observe exciting, behind-the-scenes jobs that they never knew existed. They are counseled to have aspirations that they will carry with them into junior high school and beyond.

Many partnerships target particular professions that are being entered by only a few members of minority groups. Xavier University in New Orleans sponsors intensive programs for academically talented African-American high school students interested in the humanities, math and science, engineering, and medicine. For example, the SuperScholar/EXCEL summer program works directly with high school counselors to identify talented juniors and seniors. Students are challenged by the study of philosophy, quantitative reasoning, speech and debate, creative writing, vocabulary, history and verbal reasoning. They learn to work in groups led by college students. The students are tracked and encouraged to attend graduate or professional school (Stoel, Togneri, & Brown, 1992). (See in this monograph Terry Lee's "California's Mathematics, Engineering, Science Achievement (MESA): Building a Pipeline of Success," a California-based program that encourages students of color in mathematics, engineering and science; and also in the monograph see Harold Haskin's "LEAD Program in Business: Leadership, Education, and Development," a discussion of a program at the University of Pennsylvania.)

Finally, ability tracking presents one of the most insurmountable barriers to college entrance for many low-income students and students of color whose parents are not college-educated. Tracking is also one of the most difficult barriers for partnerships to address because it requires change in a long-standing practice of the school system. Ability tracking is a system used by some schools to place students in either high-, middle- or low-ability groups with usually only students in the high-level groups being properly prepared for college. Colleges have sanctioned tracking because it helps them to identify the population to target for admission. However, the poor children described in Duckett (1988) are not likely to be in the high-ability groups, and their parents are not likely to know how to advocate in their behalf.

Once labeled as unprepared to learn at grade level, students are unlikely to escape from that label. *Locked In/Locked Out: Tracking and Placement Practices in Boston Public Schools* (Dentzer & Wheelock, 1990), says, "The grouping and placement practices which categorize students by alleged ability ensure the isolation of students labeled as 'different,' treat diversity and heterogeneity as liabilities rather than assets, and allocate the most challenging and enriching educational experiences primarily to students categorized as most 'able'" (p. 2). The result, according to the report, is a placement process that decreases student achievement: "Fewer and fewer students are deemed 'ready' for grade-level learning at each sorting point. The creation of new categories for 'unready' students removes them even further from grade level knowledge" (Dentzler & Wheelock, 1990, p. 5).

The process of sorting and labeling students commonly begins in school systems during the elementary school years (Braddock, 1990). Descriptive labels (e.g., high-, average-, or low-achieving in the area of language) are deceptive in various ways. The labels obscure the fact that youngsters do not all develop at the same pace, nor are they all equally skillful in engaging in conversation with the adults who label them. The labels also reflect only local standards, so one elementary school's at-risk student could be considered average or even gifted in another elementary school or in a different classroom in the same school. According to Richardson and Colfer (1990), who studied elementary and middle schools under an Exxon Education Fund grant, "Students could be at risk in one class but not in another . . . In all cases, the designation of at-risk relied very much on the nature of the student body within a particular school or classroom and the goals, aspirations, and instructional programs of the teachers" (p. 118). From kindergarten through graduate school, educators have too few opportunities to meet and exchange knowledge and perspectives, and, in similar ways, their students are also sorted, labeled, and isolated from each other.

Labeling and placing students in an ability track is a major factor that negatively influences a student's passage from elementary through high school. In varying degrees, ability tracking continues to influence students in college as well. For example, in some colleges selected students enter honor programs, others take the regular course of study, while still others take remedial or developmental classes with specially designated curricula and faculty who are themselves too often isolated from mainstream faculty.

Although researchers call for mainstreaming (the placement of students in mixed ability classes), educators continue to track at the precollegiate and collegiate levels. Darling-Hammond and Green (1990) explain the persistence of precollegiate tracking, but their reasoning may be equally applicable at the college level. Darling-Hammond and Green note:

> Managing a heterogeneous classroom requires training that relatively few teachers receive and skills that relatively few of them, therefore, acquire. It requires refined diagnostic ability. It requires a broad repertoire of teaching techniques and the ability to match techniques to varied learning styles and levels of knowledge. It requires skills in classroom management even more considerable than those required in a homogeneous classroom. Because relatively few teachers are prepared to manage heterogeneous classrooms effectively, tracking persists. (p. 245)

The second reason is that the best teachers and the best curricula belong to the most advantaged students, who have parents and other advocates with political clout (Darling-Hammond & Green, 1990).

If tracking and labeling are, in part, the result of too few teachers who can effectively manage heterogeneous classrooms, then teachers need to learn techniques that work well in heterogeneous classrooms. In school systems that are still tracking students by ability, discussions with partner schools and colleges about collaborative learning could be the means of moving away from tracking. According to Smith and MacGregor (1992), collaborative learning is an effective means of fostering learning in heterogeneous classrooms. Collaborative learning brings together small teams of students who learn from each other, capitalizing on each person's knowledge and abilities and providing support for each other when necessary. By its very nature, collaborative learning is socially and intellectually engaging and brings together students with each other and with their instructors, thereby making an overwhelming difference in student retention and success in college (Smith & MacGregor, 1992). In a review of research, much of which has occurred at the primary and secondary school levels, Slavin (1992) notes:

> ...At least in elementary and middle or junior high schools and with basic skills objectives — cooperative methods that incorporate group goals and individual accountability accelerate student learning considerably. Further there is agreement that these methods have positive effects on a wide array of affective outcomes, such as intergroup relations, acceptance of mainstreamed students, and self-esteem. (p. 99)

Collaborative learning is particularly appropriate for many females, Mexican Americans, urban African Americans, and Native Americans because learning environments tend to be biased by culture as well as gender, and these cultures emphasize mutual support within groups rather than rivalry and competition (Howard, 1987).

Collaborative learning has many variations, some of which are probably unfamiliar to kindergarten through twelfth grade teachers. For example, a particular form of collaborative learning, supplemental instruction, (SI), was developed at the University of Missouri – Kansas City as a nonremedial academic support program that targets high-risk courses — the types of courses, such as organic chemistry, which professors in the 1960s said "separated the men from the boys." The SI-model provides assistance through regularly scheduled, out-of-class collaborative study sessions and has proven in many research studies at a variety of colleges and universities to have a significant impact on student performance (Visor, Johnson, & Cole, 1992). Since SI leaders are usually graduate or sometimes undergraduate students who attend the classes and then conduct study sessions, the model has generally been restricted to colleges. However, with creative modifications, SI can and has been effective in schools. SI sessions on algebra or chemistry could be held in lieu of study halls or after school with a student who has successfully completed the class leading the group.

Schools that ability-track students might be receptive to forming heterogeneous classrooms — at least on a pilot basis — if offered help in teaching their faculty any of the various models and techniques associated with collaborative learning. The techniques could be taught during a workshop or as part of the activities of an academic alliance. But for something to happen, either a faculty member or more likely the principal or superintendent of schools must take the initiative. (In this monograph see Nevin Brown's "Community Compacts for Student Success" for a description of partnerships that are making changes in the essential nature of institutions. Also see in this monograph Lance Schachterle's "The Worcester Polytechnic Institute's School-College Collaborative in Mathematics and Science," an alternative to ability tracking in the inner-city schools of Worcester, MA.)

Students who are labeled "low ability" are damaged, but so are students of so-called "middle ability." Average students, the majority, who pass quietly through the system with few advocates to call attention to their needs and potential are also in jeopardy of either not reaching college or in becoming limited in what they believe are their choices.

The Shopping Mall High School: Winners and Losers in the Educational Marketplace (Powell, Farrar, & Cohen, 1985) drew attention in the mid-1980s to the plight of the average, middle-ability student in our nation's schools. Up to the time of the report, special programs had been designed for so-called at-risk and gifted students, but the average student received much less special attention. Schools are aware of such reports and the attendant criticism. They have responded favorably to new programs such as Tech Prep and Two-Plus-Two, which are vocational-technical agreements created for middle-ability high school students. The special curricula of these programs prepare them for entry into a community college technical program upon high school graduation. (For a description of a nationally recognized tech prep program, see in this monograph the discussion by Patricia Neri, "The Rhode Island Tech-Prep Associate Degree Program," a program at the Community College of Rhode Island.)

Preschool through graduate school, faculty and administrators have the same general goal: success of the student. However, American education was not originally structured for school and college educators to gather and plan the success of a culturally diverse student body as such students progress from their first classroom experience to their last. In earlier decades, students, particularly males, looked forward to the possibility of finding a well-paying job even if they did not continue their educations beyond high school. Now the job market is shrinking, and educational expectations of employers are rising. In order to prepare students properly for life beyond high school, educators at all levels need to make time to talk about cultural and gender differences and attendant learning needs; testing, norms and the resulting labels placed on students; as well as related issues such as curricula, research, teaching and standards. Many of the difficulties — particularly poverty and cultural and gender differences — continue to be problems when students enter into the college portion of the school-college pipeline. School-college partnerships bring people together for these important discussions of barriers and how to help students in overcoming them.

Chapter 8

Barriers to College-Level Students' Success and Ways Partnerships Address these Barriers

Minority students are rapidly becoming the majority in our cities and in our classrooms. To be successful, neither schools nor colleges can expect to offer this new and richly diverse population the same curricula, teaching methods, and student services that were originally designed for White males many years ago. Middle-aged faculty and administrators remember attending college at a time when most institutions boasted to incoming freshmen that over half of them would never walk across the stage at graduation. If students are to be nurtured rather than weeded out, this attitude and the attendant practices need to change. Students need to feel that they matter, that they can succeed, and that school and college will help them fulfill their potential. The job will not be done until educators establish a welcoming, supportive, student-centered continuum for students that extends to college, through college, and beyond to further study.

Increasingly, college partners are realizing that not only schools, but also colleges need to change to accommodate a new, diverse population of students. Schools can provide their college partners with important insights in making these adjustments. Schools know the students that they are passing along and understand the problems that students take with them to college. School teachers have many opportunities to observe and interact with students because of the number of contact hours that they spend with them in Monday to Friday classes as well as during after-school activities. Often school faculty inquire about particular students and look to college counterparts for an explanation of why students of diverse backgrounds were successful in high school but were not able to succeed in college. Teachers often nudge colleges to look beyond retention figures to the identities of specific students and the reasons for their attrition.

In the past two decades, the growing concern for retention of college students has led campuses to examine the apparent and less-than-apparent reasons for attrition. For the sake of discussion, retention issues will be grouped into three broad categories: (a) social and psychological barriers, (b) classroom barriers, and (c) financial and institutional resources. Focusing on these three general categories will be helpful in exploring how schools and colleges, along with concerned others such as business and community groups, can support each other in reducing the barriers to student success and in addressing the delivery of timely, appropriate support.

Social and Psychological Barriers to Success

According to Vincent Tinto, a prominent retention researcher at Syracuse University, academic dismissal only represents 20 to 30 percent of the dropouts nationally. Other reasons reflect individual goals and commitments, the availability of financial resources, and most importantly the nature of individual social and academic experiences in college after entry (Tinto, 1994). Each student who either drops out or stops out has unique circumstances, but professors and advisors who chat regularly with students know that eventually some of their stories begin to sound disturbingly familiar. A brilliant student named **Pete**, whose family was middle class and college-educated seemed to adjust easily to college, perhaps, in part, because his older brothers had shown him what to expect. However, Pete lost his part-time job, and his financial aid check was processed slowly. He couldn't afford to buy his books until the end of September, which seemed to be too late to make up all the assignments he had missed. Pete drifted out of college.

Mary, returned to college to finish her degree after several years absence, but her husband and children resented her absence from home. Eventually, she just stopped attending classes. **Jesus**, was the pride of his neighborhood, the one who led every group and always got top grades. But in his predominately White college, Jesus missed the support of his friends, family and church. His grandmother died, and he stopped attending classes to rush to her sickbed, attend her funeral, and later mourn her loss. College seemed like a cold place. His absences exceeded the number allowed by the policies of his university. Many of the codes of the White middle class, so familiar to the faculty and White student body, were foreign to Jesus. Spanish, the language of his parents and many of his friends, was taught as a foreign language, and his accent was wrong, or at least his Spanish professor said so. Jesus responded by leaving college.

According to Bard Hamlen, former director of the Fenway Retention Consortium of 22 Boston-area colleges and universities and seven high schools, affective issues impact the retention of all students, but are especially significant for students of color, in particular, students of color from low-income families who face peer pressure from friends who do not attend college and do not value education. At home, students need family and community support. On campus, they must sense that someone is a personal advocate and generally feel connected to the college and its culture. Positive and meaningful interaction with faculty, especially outside of class, greatly enhances the likelihood of a student's success (B. Hamlen, personal correspondence, July 20, 1992).

Jacqueline Fleming, (1994), author of *Blacks in College: A Comparative Study of Students' Success in Black and in White Institutions*, also stresses the importance of a supportive environment. In discussing the success of African-American students at "Historically Black Institutions" (HBIs), she notes that students succeed even though the institutions do not have as many resources as predominantly White institutions. She feels HBIs are successful despite their relatively scarce resources because "students in HBIs have access to a wider network of relationships that are friendly, that make them feel as if they belong, and that encourage and inspire them on to greater heights " (Weber, 1992).

Psychological isolation of students of color on predominately White campuses is an issue that affects students' satisfaction with their college experience. According to Franklyn Jenifer, President of Howard University, when Harvard University was created in 1636, it was not created for women, racial minorities, or the poor. For over two hundred years, the goals, rules and practices have been established and reinforced by the privileged who established the original systems. Jenifer (1987) says, "Almost every major higher education system and institution has access as one of its major goals. The problem is that the other goals, rules, and practices, even if administered fairly by non-racist, liberal individuals, will produce the same unsatisfactory results" (p. 68). To reduce the psychological isolation of students of color who study on predominately White campuses, the New England Board of Higher Education (NEBHE) has organized networks of schools and colleges, this development often underwritten by business. The students learn survival skills from each other, share experiences, and learn how to support each other. (In this monograph see JoAnn Moody's discussion titled "Academic Support Systems for Underrepresented Students of Color.")

Another way to make schools and later colleges more hospitable to students of color is to ensure that they have faculty of color with whom to identify. Teacher corps, such as the one sponsored by Livingstone College, a Historic Black Institution in North Carolina, are efforts between colleges and schools to encourage precollegiate students to consider teaching as a career.

Students of color are not the only ones who have some problems adjusting to college. Colleges need to work to build supportive networks for students even before they reach campus. For example, at Bates College in Lewiston, ME, current students contact students from their home towns who have applied for admission. The students call the high school students and answer any questions, but often they also invite them to campus and serve as mentors. Students also hear from faculty and enjoy a close relationship with a faculty advisor throughout their four years. Students need this kind of outreach because most of them will not take the initiative to call an academic department at a college or drop by to visit. Most students do not know how to approach a faculty member and form a relationship. Faculty must take the initiative, and college administrators must ensure that faculty are trained in ways to provide a supportive environment for students.

If students do not form a bond with the college community early in their college experiences, they are likely to drift away. Commitments are tentative, especially during the freshman year. Only slightly more than one-third of all college students remain committed to one major throughout their education, and their commitment to a particular college or even a college education in general may change depending on their college experiences (Spann, 1990).

Very practical advice can help students to make the transition from school to college. Advice should include the amount of time needed for study and homework completion, getting along in a residence hall, and the need to persevere as well as identify and acknowledge confusion and ask for help (Fenway Retention Consortium, 1989). Colleges need to be able to articulate their expectations so that guidance counselors and school faculty can prepare students for the challenges they will face in college. For example, college freshmen sometimes mistakenly believe that no one notices or cares if they attend college classes. College faculty or student services staff should preview with school teachers and counselors the multitude of such issues, which are usually addressed in either a freshman year seminar or a college orientation, so teachers and counselors can begin to prepare students, particularly first-generation college students, for entrance into college.

To some degree, all students experience traditional developmental problems, such as separation from family and establishment of an identity. In addition to these transitional issues, an interrelated group of problems have become increasingly fearsome such as suicide and eating disorders as well as the interrelation of drugs, sex, sexually transmitted diseases, pregnancy, and violence.

The moral development and health of young people has caused national concern. Yet, when the budgets of elementary, middle and secondary schools are cut, guidance staffs are often the first to go. Student services staffs in colleges are also cut during difficult economic times. However, with outside funding, schools and colleges can sometimes pool their resources to everyone's benefit. In New England, for example, the nation's first school-college health alliances formed in 1991 with $400 per alliance in seed money provided by the Stewart B. McKinney Foundation through the New England Association of Schools and Colleges. Doctors, nurses, guidance counselors, health and physical education teachers in ten alliances spread across Maine, Vermont, New Hampshire, Massachusetts, Connecticut, and Rhode Island have joined with community health experts to address the health problems of their precollegiate and collegiate students. The alliances not only share expertise, but also other resources in an effort to provide a more cost-effective and efficient delivery system.

Counseling in schools and in colleges can also be made cost effective by use of trained college student volunteers to address affective problems such as drugs, sex, and sexually transmitted disease. For example, students at Brown University counsel secondary students at the Moses Brown School about date rape issues (Carrington, 1991). The college students, their peers, and the younger students involved in such programs are better able to deal with drugs, sex, and peer pressure because they are armed with accurate information and a forum in which to discuss their temptations and fears.

On a larger scale, the Urban Partnership Program, directed by Richard Donovan at the National Center for Urban Partnerships at Bronx Community College in New York, is busy shaping solutions to a number of chronic urban problems, including health issues, through the formation of community consortia. For example, in the Bronx, the partnership's participants, who include Fernando Ferrer, Borough President, and Lorraine Tregde, Executive Director of the Bronx Municipal Hospital Center, zeroed in on health care issues ranging from nutrition for elementary school children to career opportunities in health for college graduates. The Ford Foundation is funding the work through the year 2000 (Donovan, 1993).

Classroom Barriers

Students have been deemed academically underprepared as long as faculty have existed to declare them so. Students will never be appropriately prepared until faculty can agree upon their expectations and then help students to reach those expectations. Consequently, discussions between schools and colleges about academic standards and other expectations are important to students' success. Educators must be clear about expectations, and they must also make sure that students understand what is expected of them.

Standards are being developed at state, regional, and national levels. Yet, standards mean little unless the classroom teacher knows, understands, and accepts ownership of them and unless the college professor is ready for students who are being prepared according to new standards. Local discussions of discipline-specific standards are important because the talks bring greater numbers of faculty into contact with the plethora of standards being developed.

At the national level, some school and college faculty are being brought together by various professional associations to help hammer out standards. The National Council of Teachers of Mathematics (NCTM) has taken the lead in this work. Their standards (NCTM, 1989) for mathematics (kindergarten through twelfth grade) were drafted in the summer of 1987, revised in summer 1988, and first published in 1989. The group that worked on the project included teachers, supervisors, educational researchers, teacher educators and university mathematicians (NCTM, 1989). The successful development of standards may be linked to the degree to which all interested parties collaborate on their development. Diane Ravitch (1995), a senior scholar at New York University and at the Brookings Institute, has pointed out that in contrast to the controversy over the soundness of United States and world history standards released in October 1994, the relative success of the civics and government national standards may be due to the fact that the development of the standards "created a consensus process that engaged not only scholars and teachers, but also lawyers, legislators, judges, policy makers, and other concerned citizens" (Ravitch, 1995). Whether within the small setting of a local partnership or the larger national arena, educational goals cannot be set and certainly cannot be reached without the consensus of all stakeholders.

Not only professional associations but also states are in some cases developing standards. Furthermore, national standards are being developed as a follow-up to former President George Bush's Fall 1989 education summit of governors in which seven goals were set: children will start school ready to learn; high school graduation rate will increase to at least 90%; students will leave grades 4, 8, and 12 having demonstrated competency in challenging subject matter; students will learn to use their minds well in preparation for responsible citizenship, further learning, and productive employment; American students will be the first in the world in science and mathematics achievement; every adult will be literate and possess the knowledge and skills necessary to compete in a global economy and exercise the rights and responsibilities of citizenship; and every school will be free of drugs and violence and will offer a disciplined environment conducive to learning. Each year the National Education Goals Panel releases a report of the nation's progress toward these goals (Staff, 1994). These annual reports would be a useful subject of discussion for a local partnership that is interested in measuring its successes against those of others. Some partnerships are planning such discussions. For example, the Five College-Public Schools Partnership in western Massachusetts has brought together teams that consist of the technology teacher (formerly known as the shop teacher) and math and science teachers from local middle and high schools to discuss several standards: (a) basic job competencies cited in the 1991 report from the Secretary's Commission on Achieving Necessary Skills (SCANS) published by the U.S. Department of Labor, (b) state standards, and (c) the NCTM standards (M.A. Wilson, personal communication, March 19, 1995).

In addition to reaching agreement on standards, colleges also need to give schools feedback regarding the success, or lack of success, of their high school graduates in freshman classes. The State Higher Education Executive Officers (1994) report that public colleges and universities in 20 states are either sharing or in the process of sharing these data with local schools. The states are Florida, Hawaii, Illinois, Indiana, Louisiana, Maine, Maryland, Massachusetts, Minnesota, Nevada, New Jersey, New Mexico, North Carolina, North Dakota, Oklahoma, Pennsylvania, South Carolina, Tennessee, Virginia, and Washington (E. Rodriguez, personal correspondence, June 2, 1994). The data require interpretation to be really useful to schools. When presented with such data, faculty from the schools commonly ask their college counterparts: "What can our students do best? What do we need to teach so that fewer of them place into remedial courses? What do your college-level placement tests look like? How do you grade? These data show how many of our schools' students finish both semesters of freshman English successfully, but can I get information about a few particular students?" The dialogues ensure that the data that are reported to the schools will be used to build a smoother transition from school to college.

Within college classrooms, professors also need to accommodate the range of cultural and learning styles that students bring to college. Learning styles are preferred ways of learning. For example, concrete learners learn best if allowed to manipulate what they need to understand. Some students who do not learn well from lectures or textbooks learn easily when they are presented with a real research question for which they have to collect data and analyze results. Many school-college partnerships that teach math and science by asking students to deal with questions about their own environment find that previously unengaged students take a new interest in math and science.

Carriuolo (1989) interviewed Edmund Gordon who noted that differences in learning style are primarily individual differences not linked to any biological or genetic characteristic. On the other hand, cultural styles are certain kinds of behaviors likely to be associated with having been raised in a particular cultural background. For example, middle-class White children are socialized from early childhood to produce on demand as is expected in schools. In contrast, Hispanic mothers encourage their children to learn by exploring in a playful rather than a work-related manner, so they are less likely to respond to the seemingly irrelevant demands of adults (Carriuolo, 1989). A mismatch between student and teacher in regard to cultural or learning style can be a problem in a school as well as in a college. But school teachers, because of their continuous training in pedagogical matters, often know more than college professors about cultural differences and learning styles.

Educators who know little about rules in non-White cultures often alienate students or feel offended by the student's behavior. For example, according to Pearson (1992), eye contact is commonly considered a sign of respect and attention in classrooms. Yet, in some cultures students are expected to defer to their elders, and eye contact would be considered brazen. In Mexican-American cultures and Native-American cultures, respect is automatically accorded to an adult, but in low-income, urban African-American communities, respect must be earned by adults. These expectations have an impact on classroom behavior. For example, Native-American youngsters are expected not to disagree with an authority figure, especially one as old and wise as a teacher or professor. Consequently, Native-American students are faced with a conflict between their culture and classroom expectations if they are asked to debate their teacher (Pearson, 1992). In addition to discussing cultural issues, educators also need to address the related issue of gender. Murphy (1992) says:

> Not only must we convince our presidents and faculties of the reality of the demographics in the educational pipeline, but we must also remind them of the needs for the future. By the year 2000, for the first time in history, a majority of all new jobs will require a postsecondary education; the best career opportunities will be in the professional and technological fields requiring the highest education and skill levels; and almost two-thirds of the new entrants into the American work force between now and 2000 will be women or minorities. Thus, it is critical that we make sure that women are encouraged to pursue the widest range of curricular choices, that the opportunities for reward and recognition are as open for them as they are for men, and that our faculties in all disciplines are ready to educate both sexes. We must provide information that addresses adequately the differences that do exist between the sexes, and we must be facilitators of change, not only on our particular campuses but also in the education community at large. (p. 19)

Young women, on the basis of test scores, sometimes limit their own choices. Murphy (1992) additionally says:

> If women are consistently falling behind men in standardized-test performance because they have not taken as many of the challenging courses available to them in high school, we are creating a cycle that is self-perpetuating, and ultimately defeating. Students are pulling themselves out of possible consideration where in fact, so many of those other factors will lead not only to positive admission decisions but also success in the program. (p. 25)

Gender issues continue to affect women in college, particularly in traditional male fields such as mathematics, science, and technology. Tobias (1990) feels that college faculty tend to serve as gatekeepers with a narrow vision of the attributes, behaviors, and life-styles of true scientists. They tend to look for students who mirror themselves, which means that women and minorities are too often weeded out (Tobias, 1990). (In this monograph see Amy Emler-Schaffer's, "Women in Technology (WIT) Project: Changing the Gender Balance in Science and Mathematics," regarding a project that introduces female high school students to technology at a technical college.)

Finally, special learning supports are particularly crucial for the student with a physical or learning challenge. The needs of students with physical and learning challenges were addressed by Section 504 of the Civil Rights Act of 1973, yet the act says little about the actual delivery of services. Many instructors at the school and college levels still feel the need for more resources and new delivery models. Therefore, the topic is an especially urgent one for collaborators to address. (See in this monograph Patricia Neri's "The Rhode Island Associate Degree Program: Refocusing the Goals of General Education Programs," a discussion about a Tech Prep partnership that provides sign language for the hearing impaired, note-taking for the learning disabled, and training in the use of adapted equipment for students with physical disabilities.)

Academic under-preparedness can also arise from poor counseling regarding courses necessary for college. In other cases, with budget cuts, some schools simply do not offer the courses that students need to prepare them for college. Some students arrive at college without successfully completing basic courses necessary for study of their proposed major. Schools cannot be held solely accountable for this problem. Schools tell students that they need to take college preparatory courses and perform well in order to attend college, but many colleges, particularly tuition-driven independent institutions and open admission state institutions, turn away very few, if any, applicants.

The problem of under-preparedness continues throughout the pipeline. Too often schools and colleges prepare students with little thought to the expectations of employers. The concerns of employers have given rise to the Secretary's

Commission on Achieving Necessary Skills (SCANS), a 1991 report from the U. S. Department of Labor that urges the teaching of five competencies: the ability to identify, organize, plan and allocate resources; the ability to work with others; the ability to acquire and use information; the ability to understand complex interrelationships; and the ability to work with a variety of technologies (Secretary's Commission on Achieving Necessary Skills, June 1991).

Businesses are particularly eager to join partnerships that address articulation (the movement of students from each level of education to the next) and career counseling. Originally, such projects focused on the movement of students from high school to college, but educators and businesses are becoming more and more careful to include elementary and middle schools in such discussions. Business and industry also sometimes provide opportunities for faculty to work in relevant jobs during the summer so that they have a better sense of the careers for which they are preparing students.

Resources for Student Success

Tutors, mentors, and peer counselors are just some of the supplementary resource persons that schools and colleges use to support students. In addition to human resources, students also may need the support of technology such as software to identify and improve below-standard skills. Unfortunately, technology is expensive and not always available to students who most need support. Without appropriate personal and academic challenge and support at the grade school or college level, students lose interest and stray away.

Schools and colleges, particularly those that have banded together in consortia, commonly share their scarce resources. For example, supplies can be ordered relatively inexpensively if they are ordered in large quantity by the coordinator of a consortium. Equipment, such as an expensive microscope, can be shared with other institutions. Access to Internet is also being shared among collaborating institutions. For example, the UMASSK12 is an Internet site sponsored by the University of Massachusetts and the Five College-Public School Partnership. The site averages 2,400 log-ins per day, one quarter of which are from public school students (Mary Alice Wilson, personal correspondence, March 10, 1995).

Even subject matter experts can be shared. At Worcester Polytechnic Institute in Massachusetts, all students engage in a community service project prior to graduation. A typical project would be for a student to design a science curriculum for the local teacher to teach with technical support from the student and the student's campus advisor. The student also brings equipment from the college, such as special microscopes, to support lessons. The school benefits from not only curriculum innovation but also state-of-the-art equipment. The college benefits from a practical, hands-on experience for the college students and a chance to assist in preparing the students who will be entering college classrooms. (See in this monograph Lance Schachterle's discussion, "The Worcester Polytechnic Institute School College Collaborative: Engaging Women and Minorities in Mathematics and Science.")

A lack of personal resources is also a cause of attrition from the pipeline. Too often students enter college with a loan and a prayer. After a short time they find that they cannot continue to pay tuition and other expenses, many of which they did not anticipate because they were not counseled adequately when they made plans for college. They leave college with loans and other debts to be repaid.

In an effort to make financial aid information accurate, accessible, and understandable, colleges are beginning to counsel students about the financial resources they will need. Colleges now commonly offer to provide on-site counseling for school-age students and often for their parents as well. Low-income students and their parents too often assume that a college education is not affordable. Middle-class families as well are often confused by the terminology of financial aid counselors. Parents want and need to know how much federal and institutional aid their children may receive and, if they must pay anything, what are their options for payment. Loans are forms of financial aid, but not all parents view them as such. Whenever possible, students, particularly freshmen, should receive grant or grant and work-study packages. Orfield (1992) notes:

> Guarantees of sufficient amounts to pay all college costs might not only increase college access, but also could reduce high school dropout rates, particularly if accompanied by the kind of personal support and guidance provided in the *I Have a Dream* program, which is a private program that guarantees groups of inner-city elementary students finances and guidance necessary to go to college if they meet a certain set of well-understood requirements — the early results of this program show considerable success in increasing high school completion and college enrollment rates. If disadvantaged students believe they have a real chance of attending college, they may be much more committed to getting ready. (p. 363) (For further information regarding the *I Have a Dream* foundation, see the Appendix.)

In addition to discussions of grants and loans, college admission counselors also need to talk with students, parents, and high school counselors about work-study opportunities whereby federal funds are used to pay a student to work on campus. The student is usually assigned to either an administrative office or a faculty member. According to Orfield (1992), work study on a campus can have a positive effect on a student's college experience; consequently, colleges and universities should encourage students who are underprepared to work on campus rather than off campus. Because a work-study student is a campus employee, the student's employment on campus strengthens the student's tie with the college and the student's understanding of campus policies and practices, and often provides an opportunity to form a bond with a supervisor who may then also serve as an advocate for the student.

Students' financial needs are directly supported by some programs. With funding from the Higher Education Act of 1965, the TRIO programs — Upward Bound, Talent Search, Student Support Services, Educational Opportunities Centers, and the Ronald E. McNair Post-baccalaureate Achievement Program — have successfully identified and provided support for low-income, first-generation and disabled students. TRIO programs currently operate in over 900 postsecondary institutions and more than sixty community agencies. The supportive services provided — counseling, basic skills instruction, tutoring, information about college admissions and financial aid — assist students in achieving upward mobility by enrolling in and graduating from college. TRIO programs have sometimes sparked relationships between colleges and local schools that have grown and extended to other activities besides TRIO. (In this monograph see A. Patricia Jaysane's "Transitions: Building an Urban K–16 Continuum for Linguistic Minorities," a discussion of the "Accept the Challenge" program sponsored by Merrimack College and which grew from a TRIO program; see also "An Upward Bound Program: Reaching Out to Schools" by Peter Budryk.)

In a similar spirit, local school-college programs for so-called "at-risk" students have taken root, often with funding from the community. For example, in South Portland, Maine, 26 first-graders are all guaranteed tuition to Southern Maine Technical College through the generosity of an anonymous donor. Another institution, Clark University in Massachusetts, provides 20 scholarships to students in local schools who maintain particular grade point averages.

Colleges also have a new source of funds for projects in community schools. As of July 1994, the U.S. Department of Education required that five percent of the federal work study funds of every college or university be used to compensate students involved in community service through work-study jobs (Joo & Gardner, 1994). This legislation holds great promise of support for tutoring or mentoring programs in which college students can be paid to assist students in local schools.

Chapter 9

Compelling Reasons to Become Involved in Collaboration

Incentives and Rewards for College Professors

An opportunity to decrease student attrition and increase the numbers of well-prepared students is the best incentive for college educators to become involved in school-college collaboration. However, collaboration is hard work, and hard work often demands direct rewards. Do colleges and universities provide any direct rewards to college faculty for collaborating with schools?

To answer the question, the New England Association of Schools and Colleges (NEASC) surveyed all 235 postsecondary and higher education institutions accredited by the NEASC. One of the survey's questions requested colleges to state what, if any, incentives were given to encourage college-level faculty and administrators to participate in a school-college partnership. A total of 104 institutions responded (Carriuolo, 1991, pp. 184-185), and all but ten partnerships reported some type of reward for participation on the part of postsecondary faculty and administrators (Carriuolo, 1991, pp. 51-63).

Because the responses came from a wide variety of types of colleges and universities across the six states of New England, the responses give a good indication of common college-level rewards. Rewards ranged from stipends and released time for professors, the most common rewards, to less tangible types of rewards such as recognition. Some institutions provide multiple rewards as incentives for school-college collaboration. Of all the possible rewards, tenure and promotion consideration are the most valued by college faculty — particularly young faculty. However, consideration for tenure and/or promotion is the least common reward. The only institutions that are willing to consider school-college collaboration as a form of community service, along with research and teaching ability when determining promotion and tenure, are those with a deep commitment to collaboration with schools. Community service is often part of the mission of a state-supported college or university, but independent colleges have, in some cases, also considered community service such as school-college collaboration to be important enough to be included in promotion and tenure decisions. Some institutions have made this deep commitment, and examples of such commitments are discussed below:

- Released time and tenure and promotion consideration: At the University of Vermont, college participants in the China Project — a faculty exchange between Beijing and Vermont that developed from an interest in multicultural curricula — are given released time from class as well as tenure and promotion consideration in the community service category (Carriuolo, 1991).
- Tenure and promotion consideration: At Sacred Heart University in Fairfield, CT, participation in the university's

partnerships with the St. Anthony School is considered when a faculty member requests tenure and promotion.

- Merit pay and tenure and promotion consideration: At Colby Sawyer College, in New London, NH, merit pay and consideration for tenure and promotion are incentives for college representatives who participate in the Fine and Performing Arts Partnership with local schools (Carriuolo, 1991). At Worcester Polytechnic Institute in Worcester, MA, merit pay as well as tenure and promotion consideration are accorded to participants in the Worcester Polytechnic Institute School-College Collaboration (Carriuolo, 1991). (For a full description of Worcester Polytechnic Institute's program, see Lance Schachterle's "The Worcester Polytechnic Institute School-College Collaborative in Mathematics and Science," in this monograph.)

- Released time, release from committees, and stipend and promotion consideration: In Keene, NH, Keene State College offers several possible incentives: release from class (i.e., reduced teaching loads), release from committee work, stipend, and promotion consideration for members of the college involved in the Teaching Fellow program with the Keene Public Schools (Carriuolo, 1991).

Tenure and promotion are, for various reasons, not always a possible reward for a professor participating in school-college collaboration. Some institutions provide either additional time, money, or staff support for school-college collaborators. They offer:

- Released time: At Lesley College in Cambridge, MA, faculty who participate in the Cambridge/Lesley Literacy Project are eligible for part-time release from teaching responsibilities (Carriuolo, 1991).

- Clerical support and assistance from graduate students: The Academic Alliance for Foreign Languages, through Rhode Island College in Providence, RI, provides clerical and graduate assistant support for members of their school-college academic alliance (Carriuolo, 1991).

- Faculty stipends: At the University of Maine at Fort Kent, faculty who participate in the St. John Valley Science Project receive a stipend through a federal grant (Carriuolo, 1991).

- Appreciation: College partners are sometimes honored during high school graduation ceremonies with either a certificate of appreciation or plaudits. They appreciate positive recognition on their own campuses and on their partner institution's campus (Carriuolo, 1991).

- Opportunities for research: When professors and teachers form relationships, they sometimes engage in joint research projects, and then present the results at conferences and co-author articles (Carriuolo, 1991).

- Professional opportunities: School-college collaboration give college faculty the chance to make a positive impact on education and the lives of young students as well as improve their own professional development (Carriuolo, 1991).

In general, collegiate faculty, staff, and administrators involved in collaboration with schools agree that the work is exciting, fulfilling, and an effective form of professional development. In particular, professors often express surprise over how much they grow professionally from their contact with not only high school teachers but also elementary school teachers. Timothy Donovan, director of Northeastern University's Institute in Writing and Teaching, has noted that professors participating in the institute over the past 14 years have often commented how much they have learned from elementary school teachers also enrolled in the institute. Donovan describes elementary school teachers, many of whom pay their own tuition to attend the summer workshops, as "the original interdisciplinary experts" (T. Donovan, personal communication, July 29, 1992).

Although the respondents to the survey appreciated tangible and intangible rewards, consideration for tenure and promotion holds the potential of an enduring reward and signals to faculty that the institution recognizes that time spent in collaboration can be as important as time spent in teaching and researching. If the school-college movement is to continue growing, more institutions of higher education must reward this type of collaborative learning.

Rewards for School Teachers

School teachers who participate in school-college collaboration also deserve and receive rewards as incentives for school-college collaboration. In a 1992 survey of all 235 NEASC-accredited colleges, the coordinators of 113 partnerships, in consultation with school faculty, responded to an inquiry regarding the rewards for precollegiate faculty who participate in a partnership. Stipends were the most common reward, cited by 39 partnerships. Stipends are often provided through grants. Teachers commonly use their stipends to compensate for costs, such as child care fees, incurred through their participation in the program. Available funding sources include local foundations, foundations with a national scope, corporations, and philanthropists.

Following monetary rewards, the next most common reward was released time from class, which was cited by 15 partnerships. Five cited continuing education credits; three, graduate credit; and four, tuition waivers. Seven considered the question not applicable because their particular partnership focuses on students, not faculty. A total of 46 partnerships responded that no tangible rewards were given. However, several partnerships cited other types of rewards such as special recognition breakfasts or luncheons, letters of appreciation, and opportunities for professional growth (Carriuolo, 1993).

Some campuses have added to the list some unique incentives:

- Publication and membership in college community: The Yale New Haven Teachers Institute provides not only common rewards such as a stipend and continuing education credits, but also more unique incentives such as publication of a teacher's work and membership in the Yale community, including library privileges on campus (Carriuolo, 1993).
- Campus rank and tenure: Wheelock Elementary is a school operated by Keene State. The Keene State/Wheelock Partnership provides Wheelock faculty with rank and tenure at Keene State (Carriuolo, 1993).
- Merit plan: The Boston University/Chelsea Partnership, an innovative approach to education of the family from preschool to adult, provides a merit plan for Chelsea's outstanding teachers (Carriuolo, 1993).
- Purchase of teacher's time to engage in collaborative work: The Southern Maine partnership between the University of Southern Maine and 20 school districts that engage in various professional development activities reimburses the districts for the half-time services of each teacher who works as a site co-coordinator (Carriuolo, 1993).

Chapter 10

Forging School-College Partnerships

The first step in initiating a relationship with a school is to determine what, if any, relationships the college already has with local schools. The heads of admissions, students services, and the academic departments usually know about the college's existing programs. They may also know about any nearby colleges that are actively involved with local schools. The college may already either be part of a consortium of local colleges working with local schools or may, as a single college, have programs in place with some or all of the local schools. Joining an existing program is usually easy. New ideas and energy are welcomed.

If no partnerships exist, the best way to begin one is to seek support from within the college before approaching the school. A partnership may be the idea of one professor or administrator, but colleagues are needed to support any initiatives that may be undertaken. Furthermore, department chairs or deans sometimes have small amounts of money that they can offer as seed money to support good ideas.

After securing support, the next step is to approach either the principal of a local school or the superintendent of a local school district. Some school-college collaboratives are large, but often partnerships begin between just one college and a nearby school or two. Often these schools are *sending schools*, that is, schools that send some of their graduating seniors through the pipeline to local colleges.

Initial conversations should focus on issues of importance to the school and the college. How can the institutions support each other? What does each need, and what can each contribute to a relationship? Who are the stakeholders that should be invited to participate in the relationship? Could area churches, businesses, the parent-teacher organization, and others in the community enrich the partnership?

Exploratory conversations often take six months, and planning the organization and programs of the partnership can easily take another year. Partnerships begin slowly because the cultures of the various partner institutions differ, and developing trust takes time. Successful collaborators are always patiently persistent. While seemingly just talking, all parties learn about each other's cultures and accepted operating procedures. For example, since schools begin their day early and recess by mid-afternoon, even scheduling meetings can be awkward until the college partners adjust to the school's schedule. Whatever programs are put in place must also respect this schedule. College-level partners often find that they have a great deal to learn if they have not spent a significant amount of time in a school since their own teenage years.

Colleges are not the only ones to initiate contact. Many partnerships have started because a superintendent, teacher, or principal has called a friend at a local college. On the other hand, many school administrators would like to start a relationship with a local college, but hesitate because they don't know whom to contact.

Franklin Wilbur at Syracuse University maintains a national data base of partnership information. (See the Appendix for contact information.) This data base may either be able to supply the name of a person in charge of partnership activities at a nearby campus, or it may point out either a professional association or a school-college collaborative in the local region that maintains such information. If information is not available regarding local institutions, either the office of the academic vice president or the office of the vice president for student services at a nearby college is a good starting point. Usually a staff member can provide a referral to either the coordinator of school-college activities, if one exists, or to a person on campus who is involved in school-college collaboration and who may know about existing programs.

If, for example, a principal calls and asks for information about collaborative learning techniques, a mathematics professor who is enthusiastic and knowledgeable about collaborative learning may be asked to respond. Although collaborative learning can be applied to all subject areas, this professor may only feel comfortable working with high school mathematics teachers initially.

At this point, the principal may suggest that the professor come to the school for a meeting with the principal and the school's curriculum coordinator. The discussion would probably focus around the school's need to learn more about collaborative learning and its application in mathematics classrooms. If collaborative learning is a subject that the professor is researching, the professor may ask to engage in data collection in the classrooms that begin to use this technique. In return, the school may ask the professor to hold some *pro bono* training sessions.

Conversations such as this commonly mark the beginning of a partnership. Later conversations involve math faculty from the school and college, and eventually the institutions form an academic alliance in mathematics. If the principal is pleased with the work unfolding, he also asks for help from professors in other disciplines as well. Additional requests lead to new programs and may eventually lead to the ongoing, reciprocal relationship characteristic of a mature partnership.

Each partnership has its own unique beginning and evolution, but they all begin with a problem that needs solving and someone who takes a risk by reaching out to another institution for support. Following this chapter are two worksheets that can be used to plan and maintain a new partnership.

Nurturing a Relationship

The most successful partnerships grow and change with the changing needs of the member institutions. Colleges and schools need to review periodically their missions and goals, check their progress, and make adjustments. Partnerships must do the same. To be continued through good and bad financial times, partnerships must become a part of the very being of the institutions that comprise them.

In order to change with the changing needs of partner institutions, partnerships must engage in evaluation. Carlson (1990) says, "If the partnership movement is to go beyond programs and activities that are 'nice,' evaluation is absolutely essential. However, as we look at evaluation, educators and their partners must be careful not to look at it in terms of A, B, C, D or pass/fail, but as a managing tool which is critical to refining, renewing, expanding, and maintaining commitment and resources to the needs of education" (vii). Teachers involved in innovative programs must be encouraged to engage in program evaluation and presented with a variety of ways to assess the learning of their students. Without compelling proof of the success of new programs, it is easy to revert to familiar methods and materials.

Growing partnerships must address not only their weaknesses, but also celebrate their successes. For example, if a group of underprepared students successfully completes a summer bridge program, a dinner should mark this achievement. Decision-makers such as the college president and school superintendent should be invited to speak. Top administrators who are involved in and knowledgeable about school-college partnerships become advocates. School-college collaborators need to ensure that these CEOs are involved, for they may later pepper their speeches to the community with anecdotes about students who have been helped through joint school-college programs. Funders and others who contribute either time or money to the program should receive awards at celebrations, and the campus photographer should be scheduled to take photos that can be sent along with a press release to the local newspapers. (Sometimes local newspapers will send a reporter and photographer if notified in advance of the event, especially if the college president and the school superintendent will be in attendance.) Far too many excellent school-college partnerships have quietly dissolved because their grassroots leaders have neglected to trumpet their successes to everyone willing to listen. Partnerships can never have too many supporters.

Financiers are supporters of particular importance. School-college partnerships that rely on outside rather than internal funding are always precarious. A growing number of foundations support school-college collaboration, but each foundation eventually withdraws its support in the expectation that a successful partnership will continue on its own merits. When foundation support is withdrawn, local community groups and local businesses can be helpful in providing either ongoing funds or assistance with fund-raising. Schools and colleges also usually have some internal funds that can be contributed. Furthermore, staff of college development offices can be very helpful in ferreting out appropriate calls for proposals from foundations that have not previously funded the partnership.

Sometimes programs are so successful in solving problems that they are no longer needed, but new ones should take their place to meet other goals. A growing partnership is one that periodically evaluates and reinvents itself in order to meet the changing needs of its member institutions.

As partnerships begin to evolve, members with special interests often work on a variety of short-term projects which they later bring back to their own membership and sometimes share with the larger school-college movement. For example, in 1990 several experienced collaborators in New England got together to write a book, *Beginning and Sustaining School/College Partnerships,* as an effort to share with others how to begin a partnership and keep it growing. Later two of the book's authors, David Andrews, a professor at Keene State College, in New Hampshire, and Phillip McCormack, the local superintendent of schools in Keene, NH, joined Nancy Carriuolo, editor of the book, to work on a conference presentation summarizing the book's main points. In June 1992, the trio presented their work at a preconference workshop sponsored by the American Association for Higher Education (AAHE) in San Diego, CA. Materials prepared by Andrews, McCormack, and Carriuolo for that national workshop included two worksheets: one designed to help inexperienced collaborators start partnerships, and another worksheet designed to help experienced collaborators nurture their partnerships. Carriuolo continued to use the worksheets at national, regional, and local meetings of school-college collaborations. At each meeting, participants suggested ways to make the worksheets even more helpful. As a result, the worksheets at the end of this chapter began with the brainstorming of three experienced collaborators and have been enriched and revised many times and shared widely. They now represent the thinking of a wide circle of collaborators. As with this small example, the collegial goal of all successful partnerships is the improvement of education, not the self-aggrandizement of individuals or institutions.

Worksheet 1: Beginning an Educational Partnership

Directions: Please fill in the appropriate information in each column and then answer the questions below.

Your Needs	Organization/Contact to Satisfy Need	Your Resources	Funding Sources/Contacts	Stakeholders

1. *(a)* Where and when should an initial brainstorming session be held? *(b)* Star the names of all stakeholders (above) who should be invited to the initial brainstorming session in which needs are discussed or further identified. (Invite *all* stakeholders.)

2. Which people do you think may be potential leaders? Double star their names and ensure they can all attend the initial brainstorming session.

3. *(a)* Who will you invite to work with you in creating the initial agenda and facilitate the first meeting?
   (b) What problems do you anticipate?

4. Circle a need that you would like to address first. (Be sure it is likely to be one that you can use to score an early success.)

5. *(a)* Where should you publicize your first success? *(b)* Who can potentially assume responsibility for publicity?

6. How will you evaluate your work?

7. What rewards will be offered to participants?

8. Will you suggest a contract between participants?

Worksheet 2: Sustaining an Educational Partnership

Directions: Please fill in the appropriate information in each column and then answer the questions that follow.

Completed Goals	Continuing Needs	New Needs	Obstacles	Potential New Partners	Funding Sources

1. *(a)* Have you disseminated information about your success? *(b)* How might you disseminate information more widely?

2. *(a)* How do you communicate within your partnership? *(b)* How could you improve communication?

3. *(a)* Is your partnership institutionalized? *(b)* Which stakeholders still need to be attracted? *(c)* What are the obstacles to their support?

4. *(a)* Do you actively recruit new partners or participants?

5. *(a)* Does your partnership plan effectively? *(b)* How do you evaluate?

6. *(a)* Are commitments honored? *(b)* If not, why not?

7. How do you celebrate success?

8. *(a)* How do you reward participants? *(b)* Have you asked what rewards they would most appreciate?

Book I
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Book II

A Sampler and Discussion of Various School-College Partnerships

with chapters by:
Nevin Brown, Peter Budryk,
Victor Ellsworth, Amy Emler-Shaffer,
Harold J. Haskins, Patricia Jaysane,
James E. Kowalsky, Teri Lee, JoAnn Moody,
Patricia Neri and Cheryl Serra,
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Preface

by Nancy Carriuolo

Three of the following chapters discuss national school-college initiatives sponsored by the College Board and by the American Association for Higher Education (AAHE) as well as a regional effort undertaken by the New England Board of Higher Education. Such large, well-funded efforts are not within the scope of most single institutions; however, the initiatives affect large numbers of students, are carefully evaluated, and provide some valuable insights regarding school-college collaboration.

Other chapters describe local partnerships, the type of collaborative effort that almost any institution can launch. The types of educational institutions represented range from kindergarten through graduate school. Some of the partnerships are community-wide efforts involving multiple schools, colleges, and community groups; but others describe a single college working with local schools. The partnerships use engaging programs in diverse subjects such as music, math, technology and business as vehicles for making college an aspiration for greater numbers of primarily low-income urban and rural female and/or minority youth.

In addition to learning about the programs of these partnerships, you will learn how each partnership began, grew and changed, and has been able to demonstrate through evaluation the effects of school-college collaboration on student success. Some of the school-college relationships described in the following chapters are innovative initiatives such as AAHE's Community Compacts for Student Success, while others such as the Upward Bound Program at Wesleyan University represent school-college collaborations that have endured for two decades or more.

The following are brief descriptions of the chapters of Book II:

Chapter 1: The LEAD Program in Business, Leadership, Education and Development is a program at the Wharton School of Business designed to attract talented students of color to medicine, law, education, and engineering. The program has nine other sites at outstanding graduate schools across the country.

Chapter 2: Upward Bound at Wesleyan University, a TRIO program begun in 1972, is one of the oldest programs of its type. Upward Bound serves low-income students who represent potentially the first generation of their families to earn a bachelor's degree. This program has been designated by the U.S. Department of Education and the National Council of Educational Opportunity Associations as a model for pre-college compensatory programs.

Chapter 3: This chapter briefly discusses several of the numerous school-college initiatives that the College Board has undertaken in the last two decades and shares some lessons learned about school-college collaboration.

Chapter 4: California's Mathematics, Engineering and Science Achievement (MESA) provides academic and affective support for students of color at the pre-college and university levels so that students can succeed in scientific and technical fields.

Chapter 5: The Women in Technology (WIT) Project at Vermont Technical College, a two-year institution, encourages girls and women to study advanced math and science in high school and inspires them to pursue technical careers.

Chapter 6: The Rural Alaska Honors Institute encourages Alaska Natives and American Indians to enroll in and persist at the University of Alaska.

Chapter 7: Transitions is a K–16 partnership between Merrimack College, a Catholic institution in Massachusetts, and two local schools. The program focuses on access and retention issues that affect students whose parents are from Puerto Rico, the Dominican Republic, and Ecuador.

Chapter 8: The Rhode Island Tech Prep Associates Degree Program at Rhode Island Community College received an award from the American Association of Community Colleges (1991) as one of three model tech prep programs nationally. Tech prep programs put high school students who once were in unstimulating general education programs on a fast track to college via a goal-oriented program of study that prepares them for either further technical education or jobs.

Chapter 9: Music Plus is a program sponsored by Bowling Green State University in Ohio. The program attracts economically disadvantaged local junior and senior high students who are hooked on music.

Chapter 10: The Worcester Polytechnic Institute School-College Collaboratives in Mathematics and Science aims to make a difference in precollegiate mathematics and science instruction. For over 20 years, WPI students have earned credit for working with local schools on special projects called IQP's. The college's involvement with local schools has grown and changed with the recent addition on campus of a publicly-funded high school for high achieving high school students in mathematics and science. The new academy strives for equal representation of gender and color.

Chapter 11: The New England Board of Higher Education (NEBHE) provides affective support for networks of students of color from various educational levels.

Chapter 12: The American Association for Higher Education (AAHE) is sponsoring Community Compacts for Student Success at six sites across the country. The local projects are making progress by altering outdated policies and procedures for advancing students to college.

These partnerships vary in terms of their geographic locations, their stages of development, the types of programs they offer, and the students whom they serve. However, they all have adopted some common strategies for meeting the needs of students in the pipeline:

- providing information about college-going;
- offering access to strong college preparatory curriculum and instructional practices that facilitate learning;
- inclusion of teachers and parents who maintain high standards for and expectations of students;
- providing academic and social support to help students meet those standards and fulfill those high expectations;
- offering assistance in securing the financial resources to pay for college as well as financial support itself;
- being capable of different levels of intervention. (Stoel, Togneri, & Brown, 1992)

The following sampler of partnerships represents some of the many ways that schools and colleges collaborate and use the above six strategies identified by Stoel, Togneri, and Brown (1992). (See also in the Appendix a list of organizations and directories that can be used to locate hundreds of other partnerships across the nation.) In the spirit of collaboration, the coordinators of school-college partnerships are glad to share their advice and experience in helping others begin partnerships. Experienced collaborators are a valuable resource. Please borrow and adapt their ideas freely.

Chapter 1

The LEAD Program in Business: Leadership, Education, and Development

by Harold J. Haskins

A Problem that Brought Collaborators Together

In 1979, a vice president of McNeil Consumer Products Company, the manufacturer of Tylenol, was interested in finding a way to expose greater numbers of minority students, specifically African-American high school juniors, to principles of business, management, and commerce. He approached the Dean of the Wharton School at the University of Pennsylvania about establishing a summer business institute that could orient and filter a critical mass of talented minority students through the *college pipeline* to corporate business. Corporate managers, corporate boards of directors, and recruiters had begun to recognize that African Americans in particular, and other minorities, were significantly underrepresented in the business world. The most talented minority students were attracted to the professions of medicine, law, education, and recently, engineering. The corporate executive was interested in developing a summer business institute to increase the likelihood that minority students would seriously consider business careers. As a consequence, such an experience would increase the likelihood that a larger pool of minority students would apply for admission to Wharton and other business schools in greater numbers. An effective program would also dispel the perception that African Americans and other minorities were not capable of ascending to leadership positions in business communities.

The Wharton School had also identified retention of African-American students as a problem. In keeping with discussions on issues of retention, McNeil Consumer Products Company and the Wharton School were interested in determining ways in which the development of interactive group processes could impact the career interests of this group of elite minority high school students (Tuckman, 1965; Bettenhausen, 1991). They initially wished to develop students' coping skills through a comprehensive business orientation program to prepare them for college life..

The LEAD — Leadership, Education and Development — concept at the precollege level was designed to be the initial stage of a recruitment and retention process for minorities at the Wharton School. The collaborators thought it would be possible to accomplish this at Wharton for two reasons: (a) The McNeil/Wharton collaboration had strong corporate support because corporate America was interested in developing a pipeline of talented minority candidates for middle management positions; and (b) business schools and corporations had an established history as partners in the use of applied learning models to solve corporate organizational problems. The partners concluded that developing minority talent should become a "collective enterprise" in accomplishing a mutual mission (Astin, 1988, p. 201).

A Model for Addressing the Problem

Description

In 1980, The Wharton School of Management at the University of Pennsylvania, sponsored a four-week summer business institute for 30 qualified minority students between their junior and senior high school years. LEAD was established to introduce high school leaders to the world of business, economics, finance, and management through a carefully tailored curriculum involving Wharton faculty and guest lecturers from industry. The program draws on the considerable resources of the University, the City of Philadelphia, the Mid-Atlantic Region, and surrounding areas of interest. The program is both academic and introductory in nature. No previous knowledge of, or familiarity with, business disciplines is necessary for participation in the program.

Throughout the four-week course of study, students are given basic reading and homework assignments; they are expected to engage actively in the analysis of economic problems, decision making, and policy formulation. Small classes and the personal involvement of faculty help to stimulate interest in business and economic problems while promoting genuine interaction among members of the class through the resolution of challenging issues.

The general course of study features:

- introductory classroom lectures four mornings per week;
- study and discussion of actual case studies presented by representatives of the companies from which these actual management decision-making cases are drawn;
- basic instruction in computer usage and its application to business problems;
- a series of lectures by leaders in government, business, and media;
- scheduled class visits to places of interest and plans for trips to a major industrial factory, a research laboratory, and minority-owned businesses among others.

Although general in scope, LEAD provides students with a firm grounding in patterns of economic behavior which influence and shape American society. Students are asked to deal with such questions as: How do corporations motivate people to buy and sell? What is inflation's role in the development of new sources of energy? Is unemployment necessary? How does a major manufacturing firm introduce a new product without fear of failure? Are unions big business? Is education big business? The format for instruction and discussion is varied, permitting the greatest possible involvement of students and faculty in their investigation of economic issues and problems.

A central feature of the Wharton LEAD Program is the attention paid to principles applied in the practice of successful minority retention programs. To encourage structured student involvement in the learning process, faculty and administration encourage participants to form sub-groupings within the class of 30 students (Astin, 1988). Such sub-groupings range from five separate case study groupings to a coed basketball team. Residential group living arrangements on campus and on field trips are similarly structured to encourage the development of group cohesiveness and group identity.

Population Served

Students accepted into the LEAD program nationwide are culled from the ranks of the top two-percent of minority high-school students — those who have demonstrated leadership ability, a sustained record of academic achievement, and a genuine curiosity and enthusiasm for learning. The Wharton School does not work directly with the schools that supply students. A Better Chance, Inc. (ABC) has handled the recruitment, selection, and placement of LEAD participants. Since 1963, ABC has placed highly motivated and talented minority students in the nation's finest high schools. In a 1992 study of the 300 students in the ten programs, 153, or 50.8% of successful candidates had one or more parents with some college education and had PSAT scores averaging 48, verbal, and 54, math (Griffin, 1992).

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In January 1990, LEAD conducted a survey of 2400 LEAD alumni, primarily to collect information for a permanent alumni database. Alumni were queried about their LEAD program experience, family background, academic progress, academic funding, and employment experience. An analysis of demographic information revealed that the largest groupings of alumni are African Americans and women. The ethnic breakdown was 67% African American, 10% Mexican American, 10% other Hispanic, 8% Asian American, 2% Native American, and 3% multi-ethnic. Fifty-seven percent of these students were female, and 42.5% were males.

LEAD alumni do well in college. The average cumulative grade point average is 3.2. Twenty-seven survey respondents received graduate degrees as of 1990, and 124 respondents were working toward graduate or professional degrees. In college, 37% of LEAD alumni chose either a business or a business-related major, 26% chose a business minor. Forty-six of the respondents had taken one or more business courses (Haskins, 1990).

The Providers

Corporate collaboration with Wharton School is illustrated through a most distinctive funding mechanism. Corporate sponsors provide funding for all program activities, including honoraria for faculty and administration, student stipends, and transportation. Each university is required to match corporate contributions by providing room and board for the participants. In-kind contributions such as lunches, dinners, and promotional items are provided by corporate hosts. Wharton faculty members view this collaboration as an honor, and they donate their time and effort as instructors in this program.

The LEAD Program at the Wharton School, as at other affiliated universities, depends on a compendium of corporate resources, university supports, and individuals for services. Corporate representatives from six of LEAD's primary corporate sponsors either prepare case studies or participate with Wharton faculty in preparation of these curricular materials. Those representatives and colleagues also make themselves available to students for classroom presentations and field trips. The students are enveloped in the Wharton LEAD atmosphere, specifically with the presence of LEAD alumni undergraduates who are supportive and encouraging role models.

Other LEAD Sites

LEAD has grown to a national program with nine other sites at outstanding graduate schools of business across the United States: University of Arizona, Columbia University, Duke University, Northwestern University, University of California – Los Angeles, University of Michigan, University of Minnesota, University of Virginia, and University of Texas at Austin. These sites form a loose confederation, but each must raise its own expenses. The curricula vary with the academic culture of each host institution. However, the class size remains constant with thirty students in each program.

Improving Access and Retention through Collaboration

The term "academic difficulty," as described in the literature, captures some of the barriers to college access and retention. Poor study habits, inadequate study skills, poor social skills, inadequate financial resources, and isolation are but a few of the reasons access and retention issues are important in the lives of minority undergraduates (Tinto, 1989).

LEAD at Wharton conceptually builds a "bridge" between high school and the sophomore years at Wharton School (and the University). The bridge minimizes the students' academic, social, personal dilemmas and uncertainty. It is constructed by utilizing knowledge of their backgrounds. Additionally, it provides a foundation of support for their transition, academic success, and social development.

The LEAD model "argues for programs that are aimed at increasing student involvement, both academic and social, as early as possible in the student's undergraduate experience. Better yet, it occurs at the precollege stage of their academic lives. Matching students with faculty members or with significant others to stimulate intellectual exchanges are not just 'feel good' activities, but solid building blocks in students' learning processes. Such experiences ease pain, while helping to retain self esteem, when students encounter academic setbacks or personal hardships along the road to graduation. Such experiences must be structured for a large number of students, especially minority freshman and sophomores. For these students, their essential early involvement in the University's culture may be highly dependent on the degree to which a faculty member or an administrator takes a personal interest in them. This interactive process cannot be left to chance in any institutional response to ensure the well being of minority and other students at Penn" (Haskins, 1992, p. 3-4).

The LEAD Curriculum

The Education Triangle Curriculum

Although the curriculum, content, and methods of LEAD at Penn are reviewed, revised, and renewed each year, the three underlying central components remain the same. Each element of this "educational triangle"— classroom activities, field trips, and an essay contest — reinforces the other two.

In addition to its general business courses, LEAD at Penn has pioneered in providing minicurricula that offer in-depth looks at particular subareas of the business world. The Arts Management component of the program, added in 1987, opens students' eyes to a behind-the-scenes view of arts institutions. Art culture is revealed as a big business, whose management requires the same fiscal and programmatic responsibility as other ventures. Good management is also critical in the field of education; Business of Education was added to the curriculum in 1990. Presentations are made by senior Penn officials.

A particularly exciting and innovative aspect of the curriculum is the computerized "Business Simulator Game." Here students put their classroom experiences to the test by managing the start-up, growth, and maturity of an imaginary company competing with other firms in a new industry. Participants learn the strategic moves — price changes, advertising, product innovation, marketing innovation, and cost cutting.

A particularly exciting and innovative aspect of the curriculum is a computerized "Business Stimulator Game." With this students put their classroom experiences to the test by managing the start-up, growth, and maturity of an imaginary company that is competing with other firms in a new industry. Students learn first-hand the classic strategic moves: price changes, advertising, product innovation, marketing innovation, and cost cutting.

Field Trips

Field trips make up the second side of the LEAD educational triangle. As an extension of classroom activities, participants travel to major corporations in Philadelphia, Washington, and New York. Minority and non-minority executives offer insights into their corporate environments, answer the students' (often probing) questions about industry and company strategies and policies, and dine and chat informally with the students.

One of LEAD's most valuable curricular components is the case study presentation. Students are charged with making sense of, and providing a concrete, problem-solving response to, an actual corporate dilemma. Through their discussions with experts and peers, students put their knowledge into practice, testing their oral communications and writing skills as well as their interpersonal and leadership skills. Case study presentations are made to such corporations as McNeil Consumer Products Company, FannieMae, AT&T Network Systems, and Campbell Soup Company.

Essay Contest

The third side of the LEAD educational triangle, the essay contest, speaks to ever-growing concerns about the abilities of business communicators, and the public at large, to express themselves clearly and fluently. This directed writing exercise introduces students to the broad notion of writing as a way of posing and solving problems, exchanging ideas, and collaborating. The essay offers participants an opportunity to document their newly discovered understanding about the principles and practices of business, focusing on such topics as social responsibility, diversity, business and education, business and the arts, motivation, and leadership. In a 500-word essay submitted during the last week of the program and worked on throughout the month, students are compelled to address a problem or issue that engages them. In so doing, they focus on the material covered in class and on field trips. Because their writing is a continuing project, the contest also shapes the questions students pose to presenters or attempt to answer through library research. The final products are the result of intensive listening, speaking, reading, writing, and revising, sustained throughout the four weeks of the LEAD Program. Selected essays are read at the program's closing ceremonies and published in *Quest*, the official LEAD yearbook.

Evidence of Success

During the course of the program, LEAD is evaluated by several groups at different points in time: (a) by students weekly and at the conclusion of the program and (b) by professional staff and faculty through a survey. Both short-term and long-term measures offer evidence that the program profoundly affects students' perception of the business world. LEAD also encourages many of them to seek admission to academic programs in the four Penn undergraduate programs. Penn was seen by many students as the ideal place to pursue their education, whether in business or in other fields. Students spoke of being "hooked on Penn," of having never considered Penn before, but now being determined to apply for admission, and ranking Penn as their first-choice college.

Classes on economics, marketing, and ethics were touted; one young woman claimed that she "learned enough to fill a semester or two of school." She also expressed gratitude for the diversity of students. Minority students who attend Ivy League schools are particularly inspired and reassured in the presence of so many talented minority peers. Said one, "LEAD has shown me that I am not alone in being a young, motivated, ambitious, and intelligent minority student." Another reflected on her newfound "confidence and self-awareness."

Students spoke emotionally of their LEAD experience. One young man said that he considered his fellow students "no longer students, but family." Another declared that the program was the best experience of his life. Yet another said, "The students are wonderful. I've never met such open, intellectual, strong-hearted individuals. Overall, the experience is worth anything and everything. I shall never forget it."

Alumni have also been surveyed. In 1990, approximately 2400 LEAD alumni from all 10 sites gave very high ratings (on a scale from a low of 1 to a high of 10) to dimensions of their programs: (a) business classes, 7.82; (b) guest speakers, 8.59; and (c) field trips, 9.27. Only 39% of these applicants, whose backgrounds ranged from upper-middle-class suburban to lower-income inner city, reported applying to LEAD because of a preexisting interest in a business career. Moreover, for 78% of the respondents, LEAD was their first formal exposure to business (Haskins, 1991).

The survey also showed impressive academic performance by LEAD alumni. Thirty-seven percent of respondents had a business or business-related major in college; another 26% took business as a minor, and many others took at least some business courses. The average undergraduate cumulative grade point average was 3.2. Twenty-seven percent of respondents had graduated from college at the time of the survey, most with bachelor's degrees. Fifty-one percent were finishing their undergraduate degrees. The latest available figures show that, as of January 1991, 95% of the more than 2,500 national LEAD participants had gone to college; over 85% had graduated (Haskins, 1991).

A survey of the 180 alumni of the LEAD Program at Penn for the classes of 1980 through 1985 was conducted in May 1987. The response rate was an excellent 70%. Seventy nine of the respondents graduated from or were students at Ivy League schools (Scott, 1987). A full 30% of the 180 alumni were presently at Penn or were Penn graduates. Many of the alumni reported that their one-month stay at Penn convinced them they wanted to attend the University (and especially Wharton) as undergraduates.

Over half of the LEAD alumni at Penn were business majors. Thirty nine alumni were currently attending Wharton; fifteen others had graduated. Most of those who majored in liberal arts, minored in business or took at least some business courses; others were considering graduate professional schooling. Even those alumni who did not plan on business careers lauded LEAD for helping them understand the role of business in all professions. Over half of the survey respondents had at least one internship during their college careers; sixty percent had two or more internships at companies that included: Dow Jones, McNeil Consumer Products, ARCO, Chase Manhattan, IBM, General Electric, Mobil, Ogilvy & Mather, Procter & Gamble, Ford Motor Company, Southern Bell Telephone, and Goldman-Sachs.

LEAD is a built-in feeder for expanding the pool of qualified minority applicants to Penn's undergraduate schools, in particular the Wharton School. In 1987, of the 300 minority students who participated in the nationwide program:

- 107 (36%) applied to Penn;
- 78 were accepted;
- 45 enrolled.

In 1989, Penn had 126 LEAD alumni students:

- 60 in the Wharton School;
- 48 in the School of Arts and Sciences;
- 14 in the School of Engineering and Applied Science;
- 4 in the School of Nursing.

As of January 1992, of the 603 African-American undergraduates enrolled at Penn, 193 (approximately 32%) had participated in LEAD:

- 101 were in the Wharton School;
- 69 in the School of Arts and Sciences;
- 15 in the School of Engineering and Applied Science;
- 8 in the School of Nursing.

Their cumulative grade point averages were higher than the grade point averages of the other Black undergraduates enrolled at Penn. (Haskins, 1992b).

The LEAD Program in Business illustrates the concept of a continuum — precollege to career initiatives — in assisting minority undergraduates to find their academic and intellectual paths at the University. The Black Wharton Undergraduate Association (BWUA) in 1984, for example, revised its charter to include a retention statement in response to the leadership of LEAD alumni undergraduates. In 1987, BWUA established an endowed scholarship fund in the name of Howard E. Mitchell, the sole African-American tenured professor in the Wharton School. The development of such leadership and intellectual creativity in young minority students is the essence of this unique partnership between corporate America and the Wharton School of the University of Pennsylvania.

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Chapter 2

An Upward Bound Program: Reaching Out to Schools

by Peter Budryk

A Problem That Brought Collaborators Together

Upward Bound programs were begun in 1966 by the U.S. Office of Economic Opportunity to meet the needs of low-income students who may be the first member of their families to graduate from college. The early years of Upward Bound (1966) were filled with challenge, excitement, and hope in Washington, DC, and on college campuses across the country. Unfortunately, these feelings were not always shared by the public schools which the students attended. In many instances the public schools were put on the defensive by universities which effectively accused the schools of failing Upward Bound youth, an accusation carrying the implication that the universities would show the schools how to do things right. During this period many Upward Bound Project Directors were either graduate students, often with independent school backgrounds, or college faculty who were most often painfully ignorant of the operations and politics of public school systems. The sad result was that the schools reacted with distrust, scorn, and only nominal cooperation with the universities which, at the same time, discovered that they did not have good answers to the educational challenges posed by young people raised in poverty, dysfunction, and racism. Universities were, by their own doing, forced to operate their Upward Bound projects devoid of any substantive cooperation with the public schools.

As a former urban high school English teacher in Cambridge, MA, who was recruited by Harvard University to help them launch their Upward Bound project in 1965-66, the author of this chapter was part of this early interinstitutional drama.

A Model for Addressing the Problem

Upward Bound youth must succeed in their schools, on a daily basis, throughout senior high school, and, therefore, it is critical that the school year and the school building serve as the focus of program operations and services.

The success of Upward Bound youth is the joint responsibility of the students themselves, their parents or guardians, their schools, and the college-university Upward Bound program. To initiate the Wesleyan University model, representatives of these groups were convened to address problems and solutions. The students wanted to be challenged to succeed, parents wanted educators to challenge them, school officials wanted to be trusted and respected, and Wesleyan University wanted to collaborate with all parties in meeting these needs. The result was a compact between the Middletown, CT, Public Schools and Wesleyan Upward Bound (WUB) that marked the founding of the partnership in 1972. The compact required that:

- Wesleyan Upward Bound would focus its resources totally in the Middletown Schools (as opposed to the five additional area school systems) for a period of at least three years;

- Upward Bound would draw its full-time summer and part-time academic year staff from among the ranks of the Middletown Schools only.

- Because the students' real educational playing field is the public school building, during the school year, WUB resource allocation would mirror this reality as opposed to the disproportionate expenditures typically laid out for the traditional six-week residential summer program on the college campus.

Terms of the compact for the Middletown Schools included:

- A mutual understanding that prospects for the success of Upward Bound youth increased as the degree of school and university cooperation and collaboration increased; that, indeed, the populations served were the charges of the school system and of the university program.

- In return for the total focus on the Middletown Schools, if both parties agreed after three years that the program's model was succeeding, the Board of Education would begin to allocate funding to the program. This measure of fiscal commitment would also, in theory, enable the university to establish a similar compact with the Meriden, CT, School System.

- Access to the full panoply of the school system's resources would be made available to the university program including:

  ◊ leadership, from the central office and school building, to assist in establishing a new organizational climate of trust, mutual respect, goal agreement, and collaboration;

  ◊ students, for recruitment and service delivery;

  ◊ staff, for recruitment, professional development, and deployment;

  ◊ guidance services, for collaboration in the critical areas of personal, college and career counseling;

  ◊ facilities, for implementing and integrating services;

  ◊ books and other curricular supplies.

The Model Produced by Compact Implementation

Creating Motivation

The personal challenge sought by students and parents was answered in the form of an experiential rite of passage conducted in the outdoors by Wesleyan's outdoor education resource center, Great Hollow Wilderness School. By arrangement with the Middletown Board of Education, newly recruited students are released two weeks prior to the end of the school year in order to participate. Goal setting, personal challenge, intellectual, physical and emotional commitment, and a standard of excellence are modeled by the Great Hollow Wilderness School rite of passage. Through a series of increasing challenges under the leadership of trained outdoor leaders, many of them Wesleyan Upward Bound graduates and Wesleyan undergraduate students of color, the Upward Bound students grow in self-awareness and confidence, self-esteem and mutual support. Activities such as technical rock climbing, whitewater canoeing, spelunking, and orienteering serve as metaphors for the challenges of self-imposed limitations, family, school, and neighborhood.

Summer Academic Preparation

Upon completion of the rite of passage, newly recruited students join upper-class students in an intensive nonresidential six-week academic program conducted on the Wesleyan campus. This component provides students with the academic preparation necessary for the approaching school year. Taught by a veteran staff of teachers recruited from the Middletown and Meriden Schools and trained by Wesleyan, virtually every college preparatory course offered at the schools, grades nine to 12, is taught during the summer. Using diagnostic tests and school transcripts, students' summer programs of studies are customized to meet their varying remedial, enrichment, and preview needs. SAT preparation, public speaking, academic competitions, financial aid counseling, and adolescent issues group discussions complement the academic courses. Serving as advisors to 4-6 students, staff conduct pre- and post- summer conferences with individual students and their parents to develop trust, clear communication, and an understanding of student strengths and weaknesses. At the post-summer conference, students complete and sign a contract stipulating specific targeted grades, attendance, punctuality, and behavior commitments for the first term of the new school year.

School-Year Component

In keeping with the terms of the compact, Wesleyan Upward Bound/CONNCAP allocates much of its resources into this phase of the program. System teachers from the summer and others are hired to continue as in-school advisors to students. They meet with advisees at least weekly and solicit written status reports from teachers in order to monitor student progress and problems. Tutoring, SAT preparation classes, college counseling, school-based Wesleyan Upward Bound/Connecticut Collegiate Awareness and Preparation Program (CONNCAP) Clubs, community service, cultural activities, student achievement events, an active Parent Advisory Group, and multi-agency referrals form the core of the academic year program.

At the end of each term, advisors conduct conferences with parents and advisees at the students' homes. At the conference, the student's quarterly contract is reviewed in relation to the term's report card and written teacher evaluations. Based on this feedback and after discussion with parents and advisor, the student draws up specific and measurable goals for the next term. One of the most important responsibilities of the advisors is in assisting the student in course selections for the next school year. Sequential and challenging college preparatory courses appropriate to each student's ability are critical to assure college acceptance and readiness.

Solving Access and Retention Issues Through Collaboration

This model addresses a host of access and retention issues:

1. *Efficacy* — Collaborators must inculcate and reinforce students' belief that they control their destinies by their decisions and actions, that they are masters of their own fate. Efficacy is the bedrock of hope, which is crucial in order for students to keep at the lonely exercises of the mind, the delayed gratifications that are necessary for success in school and in life. The challenges and successes of the experiential rite of passage are the initial activities undertaken to promote efficacy and reduce feelings of hopelessness.

2. *Aspirations* — Collaboration assists students in focussing their sense of efficacy on postsecondary education goals. Since many of the Great Hollow Wilderness School and Wesleyan Upward Bound staff are successful people of color, who have overcome poverty and are matriculating undergraduates their messages of belief in the future come from credible and supportive role models. Social, financial, and personal barriers are turned into demonstrated opportunities for success.

3. *Academic Skills* — Efficacy and aspirations are given form through the students' acquisition of academic skills. This is a continuous and lifelong endeavor. In the near term, they achieve in the most challenging college preparatory courses at their high schools and in the summer curriculum that reflects

those courses. Students are taught to understand that nothing compensates for high personal values, commitment, and hard work.

4. *Community Support* — The isolation and hopelessness of poverty and dysfunction are mitigated by the strong public support shown the students by virtually all levels of the school system and the community. This support is demonstrated in many ways:

- allowing the rising ninth grade students to miss the last two weeks of the school year in order to participate in the wilderness rite of passage;
- allocating over $40,000 annually to the program;
- in-school staff serving as advisors to students, visiting their homes for end-of-term conferences, and otherwise supporting their goals;
- attending quarterly achievement events honoring students;
- serving as speakers at weekly summer seminars and program-wide events;
- showing ownership and pride in the students and the program at professional and community events and to the media.

Evidence of Success

Four types of data provide evidence of the success of Wesleyan Upward Bound students:

1. *High School Graduation* — An average of 85% of the students who begin the program in the ninth grade persist through high school graduation.

2. *Academic Achievement* — Varying from class to class, an average of 75% of the students admitted to Wesleyan Upward Bound/CONNCAP are, in general, terminal programs of study. Upon enrollment, they enter a challenging college-preparatory program of studies. While there are struggles as they adjust to the new demands, most of them persevere and many of them flourish.

3. *College Acceptance with Financial Aid* — One-hundred percent of graduating seniors are accepted to postsecondary education with adequate financial aid packages. An average of at least 90% of the graduates enroll in college with an occasional deferral or military service decision.

4. *College Retention* — Funding resources provided for tracking college retention have recently become available for 1995-1996. A college tracking service will be used to provide data on college retention. Many of the matriculating students are hired as outdoor leaders or teaching assistants in the program during the summer. On a national basis, a 1981 study revealed that over 90% of Upward Bound graduates go on to college and are more than twice as likely to enroll in four-year postsecondary institutions as students from similar backgrounds. As promulgated by the National Council of Educational Opportunity Program:

> A more recent longitudinal study of Upward Bound students at the University of Maryland at College Park found that five years after entering the university, 65 to 68% of the group of Upward Bound graduates had received postsecondary degrees or were still in college. That compares to 44 to 47% of the general incoming college population, who had graduated or were still in school five years later. Only 27% of a group similar in background to the group of Upward Bound students had graduated or were still in school five years later. (Tardola, 1987, pp. 21-23)

Improvements to the Model

Wesleyan's Upward Bound model has evolved since its founding in 1972 and continues to change to meet the needs of local students:

1. *Earlier Recruitment* — An $88,000 grant from the Middletown School System to Wesleyan University has enabled the creation in grades seven and eight of a pre-Upward Bound program in Middletown's Woodrow Wilson Middle School. Operating during the day and after school with a staff of 12 teachers and teacher-aides, the program, EXCEL, works with 25 students at each grade level. Utilizing an advisor system, EXCEL provides in-school assistance to students, after-school tutoring, mentoring, field trips, and systematic parent involvement. EXCEL includes a summer component with a three-day student and staff motivational and group building experience at Wesleyan's Great Hollow Wilderness School, followed by a four-week summer academic preparation program at Woodrow Wilson Middle School. During the summer, EXCEL students are integrated on a part-time basis with the Wesleyan Upward Bound program through participation in weekly program events on the college campus as well as through WUB student tutoring and mentoring of EXCEL students. Eighth grade EXCEL students who meet academic and behavioral goals are graduated into the Wesleyan Upward Bound program for the summer before ninth grade. This EXCEL class is replaced by 25 rising seventh grade students.

2. *In-School Wesleyan Upward Bound (WUB) Coordination* — Starting with the 1994-95 school year, Wesleyan Upward Bound (WUB) operations have been even more closely integrated with the schools. Two WUB Assistant Directors operate as Site Manager in the schools of the two cities, Middletown and Meriden. Each of them has an office and equipment in the target high schools. On site, they coordinate the school advising system, tutoring, parent conferences, referral services, as well as student and staff recruitment, college, career, and financial aid counseling, community service, and WUB clubs at the target high schools. All of these services are provided in collaboration with the staff of the high schools. Collaboration will assure that WUB services are delivered in a timely manner, utilizing the resources of the school system and further institutionalizing WUB as an integral part of the school's operations.

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Notes

Great Hollow Wilderness School is now managed by the Regional YMCA of Western Connecticut. In September, 1995, Wesleyan Upward Bound was selected from among over 600 programs in the country as a National Model Program by the Southeastern Association of Education Opportunity Programs under a grant by the U.S. Department of Education. It was selected in the thematic category for "Partnerships for Student Success: Upward Bound and Target Schools." Wesleyan Upward Bound had also been designated a National Model in 1987.

Chapter 3

The College Board: Lessons from Two Decades of School-College Collaboration

by Donald Stewart

The College Board champions educational excellence for all students through the ongoing collaboration of member schools, colleges, universities, educational systems, and organizations.

It promotes — by means of responsive forums, research, programs, and policy development — universal access to high standards of learning, equity of opportunity, and sufficient financial support so that every student is prepared for success in college and work.

Mission Statement of The College Board

The College Board, a nonprofit membership association, arose in 1900 from a school-college collaboration seeking to facilitate the transition from secondary to higher education. In the late nineteenth century, different entrance exams for each university imposed heavy burdens on school preparatory programs. Universities, on the other hand, sought to reform the admissions process in order to tap the rising public high school enrollments; the number of public high school graduates increased fourfold from 1880-1900. After nearly a decade of efforts to build a national collaborative school-college structure, some 1,000 students took the first common entrance examinations — the original "College Boards" — in the spring of 1901. An effective and enduring school-college collaborative, one that addressed similar needs while respecting the distinct integrity of each sector, had been established. Other key programs followed a similar pattern; Advanced Placement, for example, grew out of a school-college collaboration known as the School and College Study Admission with Advanced Standing in 1954.

The turn of the century presented myriad challenges to educational institutions — heavy new immigration, rapidly industrializing cities, shocking extremes of wealth and destitution, stiff foreign economic competition, a seeming chaos of urban changes that literally reshaped the world people inhabited. Since then, the College Board has endeavored to help its member institutions serve the diverse and changing student populations that have crossed the varied institutional portals. As the nature of schools and colleges has changed, as well as the wider social context with which they are so interdependent, so have their needs in providing greater access and retention for students. Yet certain basic challenges have remained constant, if only as a persistent call to fulfill our democratic ideals and enable our institutions to provide greater educational opportunities. As is often the case, a gap continues to exist between our hopes and our successes.

Understood broadly, almost everything the Board does is meant to increase access and retention via school-college collaboration — whether in the form of improving academic preparation, student counseling, admissions procedures, or financial aid. In Advanced Placement, for example, long a model of school-college collaboration, teachers and professors meet regularly to share successful approaches, assess student work and renew an enduring spirit of collegiality. Quite simply, school-college collaboration is not limited to any one program or office. It is inherent in the way our membership association functions, including Pacesetter, our exciting new integrated curricular standards, teaching, and assessment program, as well as EQUITY 2000, our systemic urban school reform initiative. In addition, the Board proudly cosponsors a unique national collaboration, the Forum on Standards and Learning. A cross-associational operational alliance of six national subject-matter organizations and the College Board, the Forum provides a historically critical vehicle of collaborative support for independent standards-setting, one deeply embedded in the academic and teaching community. Furthermore, all College Board test committees, all Advanced Placement scoring, all Pacesetter task forces, all EQUITY 2000 advisory groups, our Board of Trustees — all are composed of a balanced range of school and university representatives. There is no other way for us to interpret our mission statement, however much we may need to do more at times. (See the end of this chapter for a list of some of the current key initiatives of the College Board.)

Lessons Learned

Beyond the individual programs and initiatives, however, we can derive some general lessons regarding access and retention. Since every particular educational setting has its own unique parameters, lessons learned from various settings and programs can provide a ready "reality check" to harried practitioners. There is no one best solution, nor a magic model that can be applied indifferently to varied settings; educational success happily remains firmly embedded in the special human relationships that nurture it. Yet those relationships benefit from broad guidelines that shared experiences can provide.

Though inadequate historical data do not allow us to compare eras, enthusiasm for school-college collaboration did appear to grow during the 1980s; at the very least, published discussion of the notion was considerable. The College Board responded to member interest in 1983 and developed a network of school-college collaboratives as a part of its decade-long Educational EQuality (EQ Models) Project. Representing the Project's dual commitment to improving the quality of precollegiate education and to extending equality of access to postsecondary education, the Educational EQuality Project Models Program for School-College Collaboration involved 55 two- and four-year postsecondary institutions and 57 schools and school systems in 19 locations around the country. From the Yale-New Haven Teachers Institute to the Puget Sound Project Equality Coalition to the Commonwealth Partnership's Humanities Institutes, the EQ Models Program promoted and shared the results of joint school-college teacher networks, curriculum dialogues, student outreach and support, parent and community outreach, and research across the country. (For a discussion of the early development of the EQ Models Program, consult Adrienne Bailey's "More Than Good Intentions: Building a Network of Collaboratives" in *Education and Urban Society*, 1986.)

The College Board learned a good deal from these and other school-college collaboratives, lessons the membership used in designing the Board's current initiatives. Chief among our concerns has been how to sustain school-college collaboratives once they have been created. In too many cases, collaborations simply stopped when external funding ended. As a recent study of the Education Commission of the States indicated, many of those involved in partnerships worry greatly about how to sustain the collaborative and how to move beyond a temporary "adopt-a-model" approach. Personal commitment to partnerships, stated the report, was often like a child with a new puppy· "[Children] are eager to have one, but negligent in its care and feeding. Like children, [partnerships] discover that getting what one wants often produces more work" (Wallace, 1993, p. 3). Research and experience during the 1980s suggested the following lessons concerning school-college collaboratives:

1. *Collaboration Is Not A Goal* — Member institutions were reminded yet again that collaboration cannot be the end sought, but rather the means by which a

shared goal is pursued. Collaboration for collaboration's sake too often leads to vapid and vague discussions, with little impact on students or schools. Too many partnerships insulated school-college collaboration into mid-level administrative offices which talked mainly to each other, or simply pursued narrow recruitment or isolated support programs. Often without a clear focus on cross-institutional goals beyond collaboration per se, many partnerships failed to integrate institutional activities beyond what was specified in the partnership program. A 1992 study by the Center for Assessment and Policy Development concluded that:

> Initiatives must either accommodate or join with other projects to address the problems that prevent their central objectives from claiming a proper place within schools. The alternative is simply to accept the fact that the initiative's objectives will often remain peripheral. (Bernard, 1992, p. 43)

2. *Focus On An Enduring Need* — Though the benefits of collegiality alone are not to be minimized, collaborations need to grow out of concerns narrow enough to become a focal point, and broad enough to allow a variety of solutions. As an evaluation concluded about the EQ Models Programs in Berkeley, CA, and Oklahoma, "the projects were not initiated merely because an educator thought the idea of collaboration was a good one; rather, they had a good idea that required collaboration" (Sosniak, 1989, p. 18).

   Individual teachers and faculty often seek opportunities for professional development, personal renewal, and intellectual growth tied to their daily challenges. A participant in a Pennsylvania Commonwealth Partnership literature institute, for example, appreciated the chance to address his direct needs as a classroom English teacher, but also found that the experience most surpassed his expectations owing to "the intellectual stimulation [which] has given me a 'self-renewal' I didn't think possible" (Adelman, 1989, p. 18).

3. *Address The "Structural Levers"* — At the conclusion of the Educational EQuality Project, the College Board asked a panel of educational leaders to evaluate the program, and to draw lessons from it. The leaders urged the Board, in its educational reform efforts, to target the "structural levers" in the school systems, namely school districts, postsecondary institutions, and states. An analysis of collaborative curriculum development during the 1980s concluded that committed "rank-and-file" educators were usually not enough, "in large measure, perhaps, because collaborative arrangements are not at all the norm in the American educational system" (Sosniak, 1989, p. 17). Those in positions of leadership, those with hands on the "levers," often make the difference in determining whether or not collaboration will surmount normal obstacles, reallocate time adequately, obtain funding, gain public support, or recruit participants.

4. *Respect Differences/Shared Goals Not Needed* — The experiences of the many collaborative efforts during the last decade revealed that schools and colleges did not need to hammer out identical goals; similar goals were sufficient, and more likely to reflect the institutional differences involved. Mutual ownership and a similar degree of commitment to similar objectives were the essentials. Goals could then be stated in terms of each institution's culture and towards which each may be convinced to strive. Too many educational institutions had suffered the indignity of externally-imposed goals, feared loss of control, and witnessed the tendency of organizations to insulate themselves from perceived change. The renewal of an institution depends upon

an internally developed and broadly held sense of mission. A sustainable collaboration must respect the differences among those missions and build collaborative renewal from those similar grounds that are shared.

Programmatic Implications

Committed as the Board is to serving schools and colleges in their day-to-day service to students, the lessons of the 1980s required translation into programmatic implications. How can students best be served, with quality of academic preparation and equality of educational access, in light of what our experience and research have taught us? While the following recommendations do not pretend to be exhaustive, they represent some core actions schools and colleges can take in order to build a sustainable school-college collaborative effort.

Choose a Clear Consensus Goal, Leave Implementation Flexible

For several years now, the College Board has formed partnerships with some 14 school districts in a major collaborative effort for systemic urban school reform — EQUITY 2000. Supporters of this collaboration include the Aetna Foundation, the Carnegie Corporation of New York, the Amon G. Carter Foundation, the DeWitt Wallace-Reader's Digest Fund, the Ford Foundation, the General Electric Foundation, the Hewlett Foundation, the Sid W. Richardson Foundation, the Meadows Foundation, the National Science Foundation, and the Rockefeller Foundation. The EQUITY 2000 school districts established a clear goal, a tough but reasonable challenge, and one which our research indicated would dramatically improve the academic options of all students: *all* ninth graders take algebra, *all* tenth graders take geometry. All take the same math; no more consumer math and its dead-end options. To date, the results of EQUITY 2000 have been tremendously encouraging. Ninth grade student enrollment in algebra approaches 100% across the sites, failure rates have not jumped, and student and adult expectations are rising in measurable ways. While this goal could gain wide consensus, challenges of implementation can be handled as each site sees fit, while at the same time sites share lessons. In turn, as our EQUITY 2000 partner schools establish partnerships with local universities, Saturday Academies, and summer institutes, they are able to build upon that consensus while retaining the flexibility to recognize the many valuable differences between and among institutions.

Develop An Ecological Approach

Improving academic preparation requires an ecological approach — a comprehensive and systemic effort to support change. Such an approach includes raising expectations across the learning community, assisting school professionals to adapt and enhance their skills, articulating curricular changes across all school levels, linking parents to teachers to counselors to university personnel. A commitment to equitable educational excellence means assuring, at times collaboratively *insisting*, that no part of the educational ecology reverts to old life forms or revives a dead-end educational niche.

Integrate Across Programs and Initiatives

Lack of program integration presents a danger to many collaborative programs. Aspects of the partnership become programs in themselves, with their own turf and culture. Barriers can arise, if innocently enough, that fragment the partnership's impact on students and their families. Across the school-college collaboration that is the College Board, we have found it essential to institutionalize integration across programs in several ways. While we always need to do more, the integration enables us to better coordinate support to faculty, students, counselors, and administrators. A college-aspiring low-income student reached by our financial aid Early Awareness Initiative, or through our Educational Opportunity Center in Washington, DC, needs to know how to prepare academically for college, how to begin saving for college early, how to take the right courses in preparation for Advanced Placement, how to locate scholarship funds through *College Cost Explorer FUNDFINDER*, and so on. Students, counselors, teachers, and parents should collaborate in order to take advantage of how the PSAT/NMSQT can improve both one's secondary academic preparation and, via the SAT, one's postsecondary options. A counselor in an EQUITY 2000 site may need to enhance dramatically her college guidance capacity and might benefit from the school-college linkages embedded in the computer software of *College Explorer*, or the telecommunications capacities of *ExPAN*, our electronic admissions service.

Integration is critical within specific collaborative programs as well. In Pacesetter, for example, new performance assessments are embedded in new curricula that both teachers and university faculty help develop and which shape integrated teacher development programs. In the 1995-96 school year, students and teachers at some 44 sites in 18 states will implement this exciting integrated approach in mathematics, English, and Spanish. We look forward to piloting Pacesetter initiatives in Integrated Science and World History soon. With Pacesetter and EQUITY 2000 in place, the two programs themselves then integrate into a "push-pull" dynamic for students. Students "pushed" to take algebra and geometry in EQUITY 2000 sites can also be "pulled" into a dynamic Pacesetter course, or even Advanced Placement. In this way, entire districts pursue the "push-pull" strategy of school reform, a strategy integrated around a fundamental renewal of academic expectations and learning experiences.

Such multifaceted and constantly evolving integration requires continual reaffirmation of the core values the collaborative intends to serve. The values remain the anchors, not the shape of the programs or partnerships. For the Board and its partners, that means regularly assessing how well we meet the challenge of our mission statement and what it demands we improve.

Advance the Conversation With Focused Data

A very powerful component in our partnerships for urban school reform, EQUITY 2000, involves the development and use of an extensive relational database of student achievements and characteristics. Beyond its obvious appeal in promoting accountability and administrative efficiency, it can also push conversations of school reform in fruitful directions. If teacher X has difficulty teaching students with characteristics A, B, and C, the database will be able to identify a teacher Z who is having more success, or even the same difficulties, with similar students. The student characteristics are not allowed to remain a reason for an ineffective learning situation, and cross-system contacts are encouraged. In addition, damaging system practices can be made apparent, and the database can then provide a means for measuring progress. For example, one EQUITY 2000 partner school district found that large numbers of eighth graders with high math grades ended up in ninth grade remedial math; they were disproportionately African-American males. The information did not solve the problem, but once identified clearly, collaborative solutions could be broached.

Build Infrastructure for Voluntary Cross-Sector Collaboration and Consensus-Building

No matter how much foresight goes into a school-college collaborative, it can never anticipate all of its challenges. Its ability to adapt will depend in part on its ability to tap quickly a broad network of colleagues, on a local, regional, and national basis. It will need to tap, and evaluate for its own purposes, experiences of similar efforts around the country, from broad approaches to day-to-day details. The isolation that plagues so many educators can be fatal to those attempting substantial reforms; an established regional and national infrastructure allows an educator to find collegiality and support in a wide variety of forums, especially on those days when it may not be apparent in their faculty lounges and lunchrooms. Advances in communication daily enhance our capacity to facilitate this cross-sector collaboration upon which enduring partnerships depend, and through which consensus can be constantly nurtured.

The Critical Challenge: From Appendages to Institutional Aims

In what might be referred to as the "second generation" of formal partnerships, school-college arrangements now emphasize the need to bring collaboratives in from the marginal office spaces they have often occupied. Cross-sector collaboration is not a goal in itself, not a budget line to be funded, but a powerful method of school renewal. That collaboration must help an institution or association carry out its particular mission, without attempting to determine that mission. Collaboration is the process that is the product of a relationship of mutual respect, and it must change as each partner changes. For that relationship to endure, it must respond to enduring needs, share common principles, and pursue similar goals.

Built upon such premises, collaborative efforts can become self-sustaining, as appears to be the case with the EQUITY 2000 collaborations. Even more important, the partner districts are adopting and adapting the goals of the partnership as their own. In EQUITY 2000 partner districts, curriculum policies have indeed changed, districts are contributing considerable resources of their own, and teachers and counselors are retraining across middle and high school levels. In Providence, RI, the district took the central objective one step farther, and is making algebra the norm for eighth graders. Milwaukee has adopted a ninth grade "Equity English." Nashville has revised its language arts curriculum along the same principles. Ft. Worth has developed its own "Equity Math" intersession refresher courses for students during breaks.

As in any collaborative, the Board continues to learn from its efforts. One such lesson involves looking inward. If collaborations endure most successfully when each partner remains true to its core values and mission, then partner institutions must be constantly aware of and reflective upon that mission. To that end, the Board has been involved in a three-year internal development and reflection process generously funded by the Lilly Endowment, forcing us to take a good look at how well we fulfill our equity mission — and in what areas this school-college association at the end of its first century must work much harder. Schools and colleges continue to evolve, responding to new populations, new academic needs, new budgetary constraints, new labor market demands, and new demands upon citizenship. So must collaborative arrangements evolve, bound to shared principles and mutual respect for differences — not to a given format or program description. As Dr. Theodore Gross (1988) summarized in his engaging study of educational partnerships, "Partnerships begin in self-interest, grow as a result of shared values, and culminate in service to all their participants" (p. 157). As the College Board nears its one hundredth year, we look to strengthen access and retention for all students, through a reaffirmation of school-college collaboration, so that our member institutions can carry a fortified Board mission into a second century of service.

Acknowledgment

My sincere thanks to my colleague at the College Board, Mike Johanek, for his invaluable assistance in the research and writing of this chapter.

Resource & Contact List

Advanced Placement — Contact: Wade Curry (212) 713-8076.

College Board Online — The College Board's site on the World Wide Web brings together schools and colleges in cyberspace. Most of the association's programs and services will soon be available on a 24-hour basis. Connect to http://www.collegeboard.org/.

College Explorer — an award-winning interactive software program that allows students to match their needs with specific offerings at 2,800 two- and four-year colleges. Contact: Carolyn Trager (212) 713-8163.

College-Level Examination Program — the most widely accepted credit-by examination program in the United States; designed to give adults college credit for learning that has been attained outside the traditional college or university setting. Contact: Orlando Toro (212) 713-8059.

Early Awareness Initiative — develops effective methods of ensuring that low-income and minority students and their families have information early about the affordability of college and the availability of financial aid. Contact: Larry Coles (212) 713-8182.

Educational Opportunity Center — community based outreach center expanding the postsecondary options of Washington, DC residents since 1967. Contact: Paulette Morgan (202) 889-5300.

Equity and the Academy — an initiative to develop ongoing collaborative links among institutions of higher education in order to improve the academic success of poor and minority students. Contact: Bob Orrill (212) 713-8214.

EQUITY 2000 – Contact: Vinetta Jones (212) 713-8268.

ExPAN — the latest innovation in college guidance technology, ExPAN links high schools and colleges nationwide within a computerized network that facilitates electronic transmission of college applications and inquiries. Contact: Maureen Matheson (212) 713-8119.

Forum on Standards and Learning — Contact: Bob Orrill (212) 713-8214.

FundFinder — comprehensive scholarship search program software designed to help students find, at no cost, sources of funding for college. Contact: Renee Gernand (212) 713-8250.

Pacesetter — Contact: Lola Greene (212) 713-8201.

Government Relations Network — a network of College Board members from secondary and higher education institutions actively involved in shaping, developing, and communicating public policy positions for the College Board. Contact: Irene Spero (202) 332-7134.

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Chapter 4

California's Mathematics, Engineering, Science Achievement (MESA): Building a Pipeline of Success

by Teri Lee

The Problem that Brought Collaborators Together

The California Mathematics, Engineering, Science Achievement (MESA) program, established in 1970, is a descendent of the Civil Rights Movement that demanded a scrutiny of equity issues in a variety of arenas, including education. Embedded in this scrutiny was this question: What are ways to empower academically people of color who have historically been excluded from opportunities?

During that time, national college statistics for minorities were abysmal. In 1972, 40% of African Americans who entered college immediately after high school left within a year (Massey, 1992). Of 43,000 engineers who graduated in 1971, only 407 were African American, with just a sprinkling of other minorities and women (Massey, 1992). At the University of California at Berkeley, only 5% of all enrolled students were minorities; enrollment in the science and technical fields was a mere 1.5% (Somerton, Smith, Finnall, & Fuller, 1994).

Alarmed by such conditions, petroleum engineering professor Wilbur Somerton and other Berkeley educators involved with the College of Engineering launched a study to determine why the numbers of minority students were so low. Through interviews of students and teachers, they found that many students of color had been interested in math, science, and engineering in high school but received inadequate academic preparation. They failed in college prerequisite classes in these areas and consequently were forced to switch to non-math-related majors. The problem, while manifesting itself at the university level, had to be addressed during the precollege years. The solution developed by educators, professors, teachers, and others laid the groundwork for the MESA Schools Program (MSP). In 1970, the first MESA program was launched at Oakland Technical High School, taught by math teacher Mary Perry Smith.

Meanwhile, similar concerns about retention were being raised at California State University-Northridge by engineering professor Ray Landis. Convinced that a drastic imbalance existed between what students of color needed to succeed and what was provided by the educational environment, Landis developed model elements of what is now the university-level MESA Engineering Program (MEP). The MEP was established in 1973-74 at the Northridge campus.

Both the precollege and university level MESA components — and the two additional programs recently launched by MESA — are based on the conviction that with academic support, development of a strong peer group to overcome ethnic isolation, and exposure to technical professionals of color, historically underrepresented students can succeed in scientific and technical fields. Consequently, all four MESA components have similar models for academic success.

A Model for Addressing the Problem

MESA, a program of the University of California, serves disadvantaged and historically underrepresented students in math-based fields, with an emphasis on African Americans, American Indians, Mexican Americans, and other Latino Americans in California. MESA's goal is to provide a pipeline of academic services from elementary through university level to increase the number of these students who attain degrees in math, science, and engineering.

MESA's major premise is that through building academic skills, these students can excel in math-based fields. The program is not remedial; it upholds high academic standards for its students. MESA does not focus solely on high-achieving students already on the track for academic success. Instead, it provides support for those who have the potential to excel and who make a commitment to work hard.

MESA utilizes strong partnerships between staff, advisors (committed science and math teachers in individual schools), university educators, industry members, school district officials, and parents. Industry involvement is especially strong, since companies realize the importance of a program that can expand the pool of badly needed high-tech professionals.

MESA currently operates 65 centers throughout the state and serves over 18,800 students. All MESA data is from school year 1993-94 and is compiled by the MESA Statewide Research and Evaluation Office (see the special section at the end of this chapter). MESA's statewide operation receives $3.58 million from state monies, industry contributions, and foundation grants. An additional $5.63 million is received by local centers through foundation grants, in-kind donations and contributions from local industry, school districts, and individual educational institutions.

MESA provides services through four components: the MESA Schools Program (MSP) for precollege students; the MESA Engineering Program (MEP) for university-level students; the MESA California Community College Program (CCCP) to assist community college students to successfully transfer to four-year institutions and graduate in math-based fields; and Success Through Collaboration (STC) to assist American Indian precollege students go on to college.

MESA Schools Program (MSP)

The MSP provides support for precollege students at elementary, junior, and senior high school levels. There are 19 MESA Secondary Program (MSP) Centers serving 266 schools in 58 districts. Over 11,800 students from grades 2-12 participate in the MSP.

The MSP model is based on a number of elements including academic enrichment, academic and financial aid advising, an introduction to industry role models, organized group study, scholarships, teacher training, career exploration opportunities, tours of university campuses, and family involvement activities.

To underscore the academic nature of the program, MSP Centers are housed at universities in colleges of engineering or science, rather than in campus administrative units. The MSP Centers coordinate the programs at individual schools, collect data, and review program progress. Schools are chosen on the basis of high enrollment of MESA's target groups, and level of commitment and financial support provided by the school district and faculty.

Interested math and science teachers become MESA advisors. Some schools provide class time, or "MESA periods," for MESA activities. Otherwise, MESA chapters meet before or after school hours or at lunch time. Most Centers offer Saturday Academies where MESA students are given additional academic training with emphasis on math, science, and engineering projects. Summer or interterm programs provide important experience with hands-on math and science projects, field activities and trips, guest speakers, and academic training.

MESA provides training opportunities for its advisors. MESA offers a three-day intensive MESA Advisors Training Institute during the summer where advisors can learn new teaching techniques and receive additional resources. A current training innovation is a two-year project sponsored by the Toyota USA Foundation to develop a model curriculum on energy and environmental issues in a cultural context and to train 20 MESA advisors from the Los Angeles Basin. Teacher training projects are also in place in San Diego and Sacramento and are discussed later in this chapter under the heading, "Evidence of Success." These training opportunities not only benefit MESA students but improve curriculum and teaching methods in entire schools and school districts.

MESA Engineering Program (MEP)

The MEP provides support to disadvantaged and historically underrepresented students enrolled at colleges of engineering and computer science. MEP Centers exist on 24 campuses throughout the state at University of California (UC), California State University (CSU) campuses and private institutions, serving over 5,300 students. Last year the MEP produced 603 engineering graduates of color, far more than any single state and marking a 190% increase from ten years ago.

The MEP is based on two objectives: to counter ethnic isolation by building a strong social and academic community of peers who take the same classes, share the same homework, and provide intensive assistance to one another; and to offer strong role models from faculty, upper-division students, and MEP alumni who are successfully employed in industry.

To achieve these objectives the MEP provides a study center to function as a "home away from home" where upper and lower division students can study, share information about classes and scholarship and financial aid opportunities, and develop a supportive peer group based on the life-style of an engineering major, complete with late night and weekend study sessions.

The MEP sponsors a freshman orientation class that teaches effective learning techniques and provides an introduction to the engineering major. Just as important, the orientation class is where students meet peers who will serve as their study partners for the next five years. Without this important course, many pre-engineering freshmen could go through their entire first year without meeting another person in their major.

The MEP is given authority by the school to cluster its students in the same classes and sections of engineering core courses. This grouping gives the students a basis to study together and prepare for the same tests, providing important academic and social support. Another important element of the MEP are workshops in which students learn complex technical concepts through group study and support.

The MEP also offers professional development training early in a student's academic career. Students are offered internship and scholarship opportunities by companies who view the MEP as a valuable source for skilled future employees. The MEP makes every effort to place students in summer jobs in an engineering environment, for the jobs not only provide valuable field experience but also serve as an important retention tool.

MESA California Community College Program (CCCP)

The MESA CCCP was developed in recognition that only 4% of African-American, Latino, and American-Indian students are eligible for admissions into the University of California or California State University. Of these students enrolled in public postsecondary education in California in 1992, almost 80% were enrolled in California community colleges. The CCCP's goal is to provide academic support so disadvantaged and historically underrepresented students can successfully transfer from community colleges to four-year institutions and graduate with math-based degrees.

MESA operates 11 CCCP Centers on community college sites. Six of these Centers were established in 1993 after the state legislature allocated $489,000 to expand MESA's community college segment. The CCCP currently serves over 850 students.

The MESA CCCP provides academic, career, and financial aid advising, transfer assistance, orientation courses, organized group study, clustering of students in key courses, career development, summer job opportunities, and a study center.

Future plans include strengthening linkages with already-existing MEPs to provide additional support to MESA CCCP transfer students. It is expected that the MESA CCCP, once firmly established, will greatly increase the number of successful transfers from California community colleges.

Success Through Collaboration (STC)

STC was established in 1991 after recognizing the need for more focused work to reach American-Indian youth. Its goal is to encourage interest and provide support in math and science so American-Indian youth will go on to college in math-based fields. STC was developed through a collaboration of American- Indian educators, the California Department of Education, other educators, government officials, and concerned American-Indian tribal leaders. STC Centers operate in 11 areas, many of which are rural sites serving students from reservations. Over 700 students are STC participants.

STC provides culturally relevant curriculum, organized group study, enrichment programs, academic and financial aid advising, assistance in obtaining scholarships, career exploration opportunities, teacher training, and family involvement. Saturday Academies provide hands-on math and science activities for STC students and often incorporate activities based on traditional American-Indian concerns such as preservation of the environment and respect for nature.

Originally targeted for junior high school level, STC has adjusted its focus to include elementary school students. Preschool programs have recently started in four sites to accommodate earlier academic intervention. Activities also have embraced family involvement and working with many age levels given the amount of interest and concerns expressed by STC families.

Resolving Access and Retention Issues through Collaboration

The MESA model has successfully broken down a number of substantial barriers that historically have prevented students of color from succeeding in math-based fields.

MESA provides a vision of academic success in college for secondary students

Time and time again MESA precollege students comment that they never thought college was an option for them until they joined MESA. Students of color are often tracked into vocational courses. MESA offers a vision of a professional career and offers the counseling and encouragement needed to work towards admission to a four-year institution. MESA arranges for role models (math and science professionals) to visit the MESA schools. Students travel to companies and "shadow" engineers and other professionals to learn about work in the field. MESA also provides tours of campuses and meetings with college students to give precollege students their first taste of university life. MSP and MEP alums complete the picture by offering personal stories of how the program helped them succeed.

MESA provides financial counseling and opportunities for scholarships and summer jobs

Students and their families are made aware that assistance is available so that financial barriers can be overcome. MSPs and MEPs are invaluable resources for scholarship opportunities and summer jobs, offering encouragement and assistance with the application process. Because of MESA's successful track record, many companies provide internships and special scholarship programs for MESA students.

MESA offers family involvement activities so students are supported both at home and in the classroom

Regular meetings keep parents apprised of program activities as well as inform them of how they can support their children. Many parents, especially those who have never attended college, want to help but don't know how, and are too intimidated by the institution to ask questions. To overcome language barriers that exist for many Latino families, many meetings are conducted in Spanish. In the San Francisco Bay Area, parents plan and sponsor an annual regional leadership conference where parents and students share successful empowerment strategies that have enabled them to play a more active role in the educational process.

MESA provides a peer group based on success

On both the college and precollege level, students often encounter intense peer pressure to steer away from academic achievement; too often, scholastic success is often derisively stereotyped as for "nerds" only. On the university level, many students maintain close ties with former high school and neighborhood friends who do not attend college and do not understand the importance of devoting long hours to study. MESA provides an important base where like-minded students can develop a peer group to support each other in efforts to excel academically.

MESA creates a continuing cycle of success

After graduating and attaining positions in industry, many MESA graduates continue their involvement with the program by volunteering at activities, speaking in classrooms, or serving on MESA Advisory Boards. These MESA alums realize that there are young students with potential who need the support and inspiration of those who have succeeded in their studies and are now employed as professionals.

MESA continues to develop innovations to ensure student success

MESA is not a static institution; countless creative initiatives have been developed in the field to meet new challenges. For example, one of the most bold and successful has been Project Success, developed in 1991 by the MEP at CSU-Sacramento to address student economic problems resulting from rising tuition and declining financial aid opportunities. Under Project Success, individual companies sponsor students for five years and provide well-paid internships during summer vacations and semester breaks. Currently 50 MEP students will receive over $2 million in financial aid and will graduate years before their peers with extensive work experience and professional development coursework. Other Centers have used their expertise to develop other innovations as discussed in the following section.

Evidence of Success

Statistics demonstrate that MESA is a highly effective program with success rates that far exceed statewide norms. The following data were compiled by the MESA Statewide Research and Evaluation Office (see the Appendix to this chapter).

- Nearly 80% of MSP students go to college the fall after they graduate; only 57% of all California high school graduates do the same.
- Nearly 62% of MESA's MSP graduates enroll at the University of California compared to 11.8% of the state's underrepresented high school graduates of color.
- African-American and Mexican-American MSP high school graduates maintain a 3.21 GPA — much higher than the 2.40 GPA of their non-MESA counterparts.
- MEP students earn 82% of all bachelor's degrees in engineering that go to underrepresented students in the 23 California universities that have MEP programs.
- MEP students have a 62.2% retention rate, compared to a 47% retention rate of non-MEP counterparts; this figure is just a shade below the 63% retention rate for Asians enrolled engineering at the University of California.
- Over 80% of African Americans and Mexican Americans not participating in MEP dropped out of engineering programs.

The above data demonstrate the general effectiveness of the MESA program. A specific element of the MEP model, the Academic Excellence workshop, was studied for five years at California Polytechnic – Pomona, by

Martin Bonsangue, Assistant Professor of Mathematics at California State University – Fullerton.

Bonsangue's (1994) report examined the effects of Academic Excellence Workshops in calculus and found that fewer than 4% of workshop participants dropped out of college, compared to 42% of non-workshop students. Furthermore, Bonsangue (1994) reported that only 5% of students in the Academic Excellence Workshop had to take six or more quarters to pass the three-quarter calculus sequence, compared to 23% of non-workshop students.

Because of MESA's success in promoting educational equity, the California State Assembly passed a bill in 1991 recommending that MESA be established in all state secondary schools with at least 40% enrollment of low-income and Latino, African-American, and American students. While California's economic difficulties prevented the bill's implementation, the State Assembly's action reflects strong public recognition that MESA works.

MESA's track record was also recognized in 1992 by *Science* magazine, which named MESA as one of the top programs in the nation to produce science professionals of color successfully.

The program's accomplishments and collaborative nature have spurred educators to use the MESA model to effect changes on an institutional level. For instance, university educators are adapting elements of the MEP model to disciplines beyond engineering. In 1986 the California Polytechnic University – Pomona's College of Science established the Science Educational Enhancement Services (SEES) program based on the MEP model. The model also has been used in the colleges of business, arts, agriculture, and environmental design.

Similarly, the University of California – Berkeley MEP's phenomenal 70.7% retention rate has led to the establishment of partnerships across departmental lines, a rare event on that campus. Collaboration is now taking place between the schools of engineering, physics, and letters and sciences to train graduate student instructors.

The MSP also is reshaping the teaching environment. For example, teacher training projects led by San Diego and Capitol (Sacramento and vicinity) MSP Centers are redefining math and science education in two major school districts. These training projects have institutionalized a math and science curriculum based on an interactive approach, developed a heightened awareness of different cultural learning styles, and have increased collaboration between school districts and other educational institutions. The teacher training programs are geared to have a "ripple effect," where ultimately math and science curriculum and teaching methods are realigned in an entire school district.

Most recently the National Science Foundation demonstrated its confidence in MESA's restructuring capabilities by awarding a five-year $2.5 million grant to the MESA Capitol Center to revamp math and science education in 50 schools within the Sacramento City Unified School District, ultimately affecting over 35,000 students. A goal of the project is to double the number of historically underrepresented high school graduates from the district who are prepared to enroll in four-year colleges and pursue math- and science-based degrees.

Finally, over a dozen programs flourishing across the nation are based on the MESA model. MESA's outstanding track record reflects a program that works. If MESA is successful in establishing a steady pipeline of academic support, thousands more students will have opportunities that previously were unavailable. That number would be increased a hundredfold if the MESA model were institutionalized and made available to all students who need its services. Then the program would truly fulfill the sentiment that gave rise to MESA's existence: to provide academic empowerment to all those who historically have been excluded.

Addendum

MESA Student Statistics
1993-1994

I. Aggregate Data for All Four Types of MESA Centers

Total number of MESA Centers
(MSP, MEP, STC, CCCP) = 65

Total Students Served 18,804

Ethnicity	*Number*	*Percentage*
African American	5,343	29.0%
Under-rep. Latino	11,537	61.0%
American Indian	1,480	8.0%
Other (Unspecified)	444	2.0%
Sex		
Male	8,441	47.0%
Female	9,635	53.0%

II. Data by Type of MESA Center

1. *MESA Engineering Program (MEP)*

Number of Centers	24
Number of Students	5,360
Degrees Earned	603

Ethnicity	*Number*	*Percentage*
African American	1,522	28.0%
American Indian	138	3.0%
Under-rep. Latino	3,642	68.0%
Sex		
Female	1,251	23.0%
Male	4,109	77.0%

2. *MESA Schools Program (MSP)*

Number of Centers	20
Number of Schools	295
Number of School Districts	58
Number of Students	11,859

Student Type	*Number*	*Percentage*
Elementary Students	1,342	12.0%
Junior High Students	3,960	37.0%
Senior High Students	6,557	51.0%

Ethnicity	*Number*	*Percentage*
African American	3,597	31.0 %
American Indian	596	5.0%
Under-rep. Latino	7,280	60.0%
Other (Unspecified)	386	4.0%
Sex		
Female	6,806	57.0%
Male	5,053	43.0%

MESA students graduated from high school:	1,359

3. *MESA California Community College Program (CCCP)*

Number of Campuses	11
Total Number of Students	857
Transfers to Four-Year Institutions	109

Ethnicity	*Number*	*Percentage*
African American	224	26.0%
American Indian	18	2.0%
Underrepresented Latino	615	72%
Sex		
Female	473	55.0%
Male	384	45.0%

4. *Success Through Collaboration (STC)*

Number of Centers	11	
Number of American-Indian Students	728	100%

Data prepared by MESA Department of Research and Evaluation, 300 Lakeside Drive, 7th Floor, Oakland, CA 94612. Telephone: (510) 987-9337.

MESA Centers

MESA Engineering Program (N=24)

California Maritime Academy
California Polytechnic State University –
    San Luis Obispo
California State Polytechnic University –
    Pomona
California State University – Bakersfield
California State University – Chico
California State University – Fresno
California State University – Fullerton
California State University – Long Beach
California State University – Los Angeles
California State University – Northridge
California State University – Sacramento
San Diego State University
San Francisco State University
San Jose State University
Santa Clara University
University of California – Berkeley
University of California – Davis
University of California – Irvine
University of California – Los Angeles
University of California – Riverside
University of California – San Diego
University of California – Santa Barbara
University of the Pacific
University of Southern California

MESA Schools Program (N=19)

California Polytechnic State University –
    San Luis Obispo
California State University – Bakersfield
California State University – Chico
California State University – Fresno
California State University – Fullerton
California State University – Long Beach
California State University – Los Angeles
California State University – Northridge
Capitol Center:
    California State University – Sacramento
    University of California – Davis
Harvey Mudd College
Loyola Marymount
Mendocino/Sonoma Counties
San Diego State University
San Francisco State University
San Jose State University
University of California – Berkeley
University of California – Santa Barbara
University of the Pacific
University of Southern California

Success Through Collaboration (N=11)

Auberry – American Indian Center of Central
    California
Big Pine – Big Pine Indian Education Center
Bishop – Owens Valley Indian Education Center
Campo – Campo Indian Education Center
Lone Pine – Lone Pine Indian Education Center
Oakland – Oakland Indian Education Center
Round Valley – Round Valley Tribal
    Council Office
Sacramento – Capitol Area Indian
    Reservation, Inc.
Santa Ynez – Santa Ynez
Stockton – Edison High School
Woodfords – Woodfords Community Center

MESA Community College Program (N=11)

American River College (Sacramento)
Cabrillo College (Aptos)
College of the Sequoias (Visalia)
Cosumnes River College (Sacramento)
East Los Angeles College (Monterey Park)
Laney College (Oakland)
Mendocino Community College (Ukiah)
Modesto Community College (Modesto)
Sacramento City College (Sacramento)
Solano Community College (Suisun City)
Southwestern Community College (Chula Vista)

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Chapter 5

The Women in Technology (WIT) Project: Changing the Gender Balance in Science and Mathematics

by Amy Emler-Shaffer

The Women in Technology (WIT) Project at Vermont Technical College was established as a pro-active response to an increasingly obvious problem — the disparity in numbers of women and men pursuing and entering careers in math, science, and engineering.

Women are severely underrepresented in technical occupations. Their participation in engineering fields has remained at approximately 15% of each year's college graduates, or a little over one out of every seven newcomers to the field since the mid 1980s (Ellis, 1992). Currently, women are concentrated in only 20 of the over 400 occupations that exist in our present economy (U.S. Department of Labor, 1987). The majority of these 20 occupations are in low-status, low-paying service sector positions.

In 1986 the college administration recognized that too few women were enrolling in technical majors. After a look at nationwide statistics, it became apparent that the low numbers were not unique to Vermont, and the Women in Technology Project was started in an attempt to create a balance.

A Model for Addressing the Problem

The goal of the Women in Technology Project is to encourage young women to study advanced math and science through high school and inspire them to pursue technical careers. To achieve this goal, WIT has specific objectives: to educate young women about technical careers; to show the relevance of math and science to professions in technology; to provide female role models; to expose girls and boys to women scientists, engineers, and technicians; to discourage traditional occupational stereotyping; and to increase teachers' awareness and effectiveness in combating gender bias in the classroom.

Recent research by the American Association of University Women shows a correlation between math and science success in school and feelings of self-confidence and self-worth. The research has also found that teachers spend significantly less time with their female students than their males in these subjects. As young women "learn" that they are not good at math and science, their own sense of worth and their dreams and aspirations for themselves falter (American Association of University Women Educational Foundation, 1992).

The significance of this problem becomes evident when considering the impact on the future labor force. Over half of the top 50 fastest growing jobs by the year 2000 will be technology-related (U.S. Department of Labor, 1990-91). Given the projected national needs for competent scientific and technical workers in the future, the current trend of participation by women in these fields is not adequate. In addition, from the viewpoint of equity, it is important that technical fields get a fair share of both women and men who have the potential to do well in this line of work.

Although the under-representation of women is a nationwide problem, the concern of the Women in Technology Project is for the young women in Vermont. Vermont's overall population is economically disadvantaged, as evidenced by statistics that indicate the state's per capita income of 1990 was $17,436, or 93.3% of the U. S. per capita income. Eleven of the fourteen counties in the state earn less than the national per capita income. Women comprise 51% of the state's population and 46.3% of the labor force. "The women's share of the labor force has remained relatively unchanged in recent years. Women continue to dominate Service (66.7%) and Administrative Support (81.8%) occupations" (*Vermont Annual Planning Information*, 1991, p. 31). These figures portray a state with a significant population of economically disadvantaged women and girls who need to prepare for better jobs and salaries in the future.

The WIT Project implements a variety of programs and activities that are designed to increase young women's interest in math and science and encourage them to consider technical careers. The following are among these programs:

1. Summer Technology Camp is a five-day residential program for 7th and 8th grade girls designed to increase their interest and knowledge in math, science, engineering, and technology through hands-on workshops. Instructors and counselors are women employed in technical professions or majoring in these areas in college. Because camp is residential, the opportunity for role modeling is significant.

   Girls are selected by their schools based on their interest in the designated courses, rather than high grades. Emphasis is placed on selecting girls from rural or economically disadvantaged families who would probably be otherwise unable to participate in a summer camp. The cost per camper is quite high, but because Vermont Technical College donates facilities and WIT receives grant funding, the fee is reduced to $200. (This amount can vary significantly based on grant funds, however it has been $200 for the past three summers. Historically, the highest fee has been $300.) Financial assistance is available to cover the designated camp fee as well. In its eight-year history WIT has always been able to provide the financial support families require. Two sessions of Summer Technology Camp are held each summer with 60 to 72 girls per session. Workshop topics include electrical, mechanical, and environmental engineering, dendrochronology, solar power, computer-aided drafting and design, chemistry, and architecture.

2. The Math and Science Institute returns up to 60 girls who attended Summer Technology Camp the previous summer for four days of intensive technology workshops. The institute follows a format and philosophy similar to Summer Technology Camp with the difference being exposure to an increased variety of technical topics via shorter workshops. Workshop topics include math, computer-aided drafting and design, technology and art, the creation of electronic games, architecture, and mechanical and rehabilitation engineering.

3. The Technology Camp for High School Girls, a six-day summer camp, is the latest addition to the camp sequence. The summer of 1995 was its third year of operation. The camp serves two important purposes by offering advanced technical workshops to 60 girls who have completed 9th, 10th, or 11th grades: (a) it provides a means of continued support and follow-up to young women who have been involved with the program since junior high, and (b) it enables other young women to become involved with the program at critical decision-making times in high school. Workshop topics include advanced math, mechanical engineering, technology and art using kinetics and polarization, medical technology, and 3-D modeling using computer-aided drafting and design.

4. The speakers bureau is comprised of about 55 women engineers, scientists, and technicians from around Vermont who are available to give classroom presentations about their specific jobs or technical careers in general. This service is available to schools and community groups.

5. Girl Scouts Computer Badge Day offers Junior Girl Scouts (grades 4-6) the opportunity to earn their computer badge. Vermont Technical College faculty and students lead the scouts through hands-on activities in the computer labs. Two badge days each school year accommodate 75 girls and 25 parents at each. Topics include interactive laser discs, computer-aided drafting and design, basic programming, computer games, electronic mail, electronic catalog, QuatroPro, and automotive computers.

6. WIT News, the Project's most recent endeavor, is a newsletter written for alumnae of WIT camps, but also distributed to Vermont schools, WIT funders and business partners, the Speakers Bureau, and camp staff. The newsletter's intent is to provide each young woman who has been through a WIT camp experience with continued follow-up support and information. Articles cover topics such as college preparation, job market trends, successful women in science and technology, the WIT Project calendar, and math puzzles.

As evidenced by the description of the Women in Technology Project's major programs and activities, this program serves Vermont students in kindergarten through twelfth grade, with the predominant focus on girls. Almost exclusively, the services are provided by women scientists, engineers, mathematicians, and technicians, who not only share their expertise but also serve as role models and help to diminish myths about technology careers for women. The WIT Project is funded almost exclusively through grants. Vermont Technical College enables WIT to use its state-of-the-art facilities such as engineering and computer labs at no charge. Vermont Technical College also provides technical assistance, classrooms, and equipment, such as VCRs, drills, microscopes, oscilloscopes, and multimeters. Meals and dorm rooms are charged at cost. These contributions to the WIT Project add up to substantial savings. In addition, Vermont Technical College houses the WIT Project office and covers expenses such as telephone calls and photocopying.

The actual "work" of the Women in Technology Project — the staff and programs — is all possible due to grant funding. Since its inception in 1986, the Vermont Department of Education has funded the Project with its federally-mandated Carl Perkins Gender Equity funds. Unlike the practices of many funders, the Gender Equity funds cover the salary of the director, enabling her to pursue other funders for specific programs.

Another significant source of support is through businesses' donation of employees' time. Many of the women on the speakers bureaus and several of the summer camp workshop instructors are professionals employed by engineering companies in Vermont and New Hampshire. These companies allow their employees to participate in WIT activities while still on the company payroll. This generous practice by companies such as International Business Machines (IBM) saves the WIT Project thousands of dollars each year.

While one might think that the rewards of the Women in Technology Project programs would go exclusively to the young women participants, adults and male students also appear to benefit. Both girls and boys benefit from seeing women employed in technical occupations, an outcome of a speakers bureau presentation. But undoubtedly the greatest student rewards are directed to the young women who participate in WIT camps. First, girls have the chance to become involved with WIT at a young age and then return to campus yearly for at least three years. WIT has been operating camps for enough years that several campers are now WIT staff, serving as camp counselors.

With a few more years experience, they will be leading workshops.

Between the opportunity to stay involved with the WIT Project over the course of the years and the direct benefits of WIT programs to young women's knowledge of career options and sense of self-esteem and accomplishment, the rewards to young participants are positive and meaningful.

As evidenced by the number of women who return year after year to participate as instructors and counselors at the residential summer camps, adults involved with WIT as well as the students benefit from the experience. Camp staff receive payment for their services, either by WIT or their company's payroll. In addition, the Vermont Technical College faculty and students who teach workshops for Girl Scouts Computer Badge Day receive a small stipend. But according to written evaluations and verbal feedback, emotional rewards, not money, bring people back. The WIT staff truly enjoy working with young women, helping to broaden their horizons and being a part of their growing sense of awareness and ability. Many know firsthand how lonely the path to a technical profession can be for a woman, and are extremely willing to serve as mentors and role models for others who may be considering the same path. Thus, while the monetary compensation is helpful and appreciated, the true rewards to the adult participants are their sense of making a contribution and the goodwill this imparts.

The collaboration between the Women in Technology Project at Vermont Technical College and Vermont schools extends to all public schools (approximately 450) and several private schools (based on enrollment) within the state. The Project has been highlighted in several magazines with regional and national distribution in the past two years. Based on inquiries, WIT appears to have become a model for similar programs in other parts of the country. However, the established programs in other states have one or more significant differences from WIT; most often they start with high school girls, are not residential, and may cost significantly more money to attend.

Attacking Access and Retention Issues through Collaboration

A very important feature of the Women in Technology Project's programs is their accessibility to economically disadvantaged young women who would be unable to attend costly out-of-state camps. Grant writing for funds to be used to override costs is ongoing. Thus, WIT is able to provide whatever amount is needed to enable young women to experience technology camp. Recently, a mother called to remove her daughter from the camp list. The mother had been laid off and could no longer afford the camp fee. Imagine the staff's satisfaction upon replying that WIT would cover the fee. In her thanks, the mother said, "[My daughter] will be so happy to hear this. I about broke her heart when I told her she couldn't go." Increased accessibility through financial assistance is one of the rewards of grant writing.

Social and psychological barriers abound when young women enter territory that is traditionally dominated by men. WIT attempts to prepare young women for some of these barriers through role models who talk about their experiences with school and college and in their work. The focus is less on the negative aspects of the barriers, such as sexual harassment and inequality, and more on the positive portrayal of successful, secure women employed in challenging, well-paying careers. In addition, WIT attempts to overcome social, psychological, and academic barriers by providing a variety of hands-on opportunities for young women to learn about engineering, math, and science in realistic, meaningful ways. Placing young women in noncompetitive, cooperative learning environments where they can work in a manner and at a pace comfortable to them provides a high rate of success and strong sense of accomplishment.

Thus, WIT attempts to remedy retention problems in two distinct ways. First, by removing financial barriers, it increases accessibility to the available programs. Second, the social, psychological, and academic barriers are addressed by creating relevant hands-on learning experiences facilitated by positive and successful role models.

Evidence of Success

Perhaps the greatest measure of WIT's success can be found in the voices of the young women who have experienced a WIT program and specifically, WIT camp. Their comments and feelings are reflected in the written evaluations they complete at the end of camp and also years later through a questionnaire sent to camp alumnae.

The following are comments that camp participants made in the written evaluations at camps' end:

> *"The program made me see what engineering was about, which got me interested in it. The different computers were neat, and I want to know all about them."*
>
> *"I realized I can do anything if I just put my mind to it."*
>
> *"I loved getting materials and figuring out how they all go together to work."*
>
> *"I liked finding out I was capable of things that I normally thought I couldn't do."*
>
> *"I just wanted to experience more technology and learn new things. I got more than I expected and had lots of fun."*

In addition, there are comments about the friends that are made and the relationships with instructors and counselors that are established. There is an occasional negative comment, but in general the feedback consistently reflects a positive and motivating experience for most participants.

Somewhat different from the evaluation of the camp experience immediately after camp's end is the questionnaire designed to serve as a tracking mechanism for WIT camp alumnae. The questionnaire asks for a variety of information from young women who attended camp as 7th or 8th graders and who are now high school seniors or one year out of high school. Questions include:

1. Did attending camp influence the courses you took in high school? If yes, how?
2. Did you take more math and/or science courses in high school as a result of coming to camp?
3. Did camp assist you in making a career choice?
4. Are you attending college or planning on attending college? If yes, what major?

In addition, the respondents are queried as to whether their opinions or feelings about math, science, and engineering were influenced by the camp experience and whether or not attending camp increased their self-confidence, made technical subjects more interesting and easier to understand, and allowed them to try things they would not have done on their own. Finally, they are asked to supply additional comments about camp and whether or not it influenced their college or career plans.

The information is compiled into a report that serves as a tracking mechanism for WIT camp participants. The system has been in place for three years, and the figures point to an increased interest in technology as a result of attending camp. For example, 126 questionnaires were sent to 1988 and 1989 alumnae. Of the 50 responses received, 46% responded that they took more math and science as a result of going to the summer technology camp. Of the eleven girls who were attending college at the time of the survey (others were still juniors or seniors in high school), nine of the 11 indicated a major in a technical field. In the 1994 survey, 157 questionnaires were sent to 1989 and 1990 alumnae. Of the 57 responses, 39% indicated that they took more math and science in high school as a result of the camp experience. Eleven of the girls surveyed were enrolled in college. Seven of them indicated a major in a technical field, and two were elementary education and math majors. The students also indicate an increase in self-confidence and greater awareness regarding career options. In addition, the array of colleges listed is impressive. Students are enrolled at colleges ranging from technical institutions such as the Massachusetts Institute of Technology, Rochester Institute of Technology, Vermont Technical College, and Rensselaer Polytechnic Institute to nontechnical private institutions such as Harvard and public institutions along the East Coast and as far west as Montana.

While the goal of the WIT Project is to increase the number of women pursuing technical careers, the intent of camps and other programs (or the measure of WIT's success) is not necessarily to convert all participants into future engineers. The intent is to promote educational equity by exposing young women to fields that often are not suggested to them, thereby enabling them to make informed decisions about their futures.

At the end of nearly a decade, some major questions remain unanswered. Why don't even more women pursue engineering and other fields of technology? Why has the number of women pursuing engineering professions remained relatively stable since the mid-1980s? Why do some women begin college in technical majors and then leave? These questions are beyond the scope of the WIT Project, but remain puzzling and challenging to those interested in occupational equity.

Much remains to be done in order to balance the scales of equity and equality in technical fields. Comprehension of the problem is the first step to its solutions. In the future, WIT intends to continue expanding its outreach by including more teachers and parents into its programs. For now, the satisfaction of knowing that the efforts and hard work of the Women in Technology Project make a positive difference to some young women is the incentive to continue looking ahead.

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Chapter 6

The Rural Alaska Honors Institute: Moving Native Americans Through the Educational Pipeline

by Jim Kowalsky

A Problem That Brought Collaborators Together

Alaska Natives — Yup'ik Eskimo, Siberian Yup'ik Eskimo, Inupiaq Eskimo, Aleut, Athabaskan, Tlingit, Haida, and Tshimpsian — are significantly underrepresented among those earning college degrees. While Alaskan White students earned about 88% of the bachelors degrees, and 90% of the masters degrees, exceeding their proportion in the population in 1980, Alaska Natives were substantially underrepresented at the bachelors and masters degree levels (Kleinfeld, Gorsuch, & Kerr, 1988). In 1984-85, Alaska Natives comprising 13% of Alaska's population, earned four percent of the bachelor's degrees and less than two percent of the masters degrees (Kleinfeld, Gorsuch, & Kerr, 1988). Some improvement has occurred in recent years but significant under-representation remains as a problem. Comprising almost 18% of Alaska's population, Alaska Natives have the lowest enrollment at the University of Alaska relative to their proportion of the state's population, the only one of the state's ethnic groups to be so underrepresented (Gaylord, 1986-88).

A high college dropout or stop-out phenomenon for Alaska Natives also continues to the present. Faced with a very difficult transition to urban, western campuses, rural Native and many other students also frequently come to college under-prepared in the academic skills necessary to survive, thrive, and persist in the completion of academic degree programs. Most degrees earned by Alaska Natives and American Indians within the University of Alaska are one- or two-year efforts; in 1988, 62% were certificates and associate degrees, 31% bachelors degrees, 7% masters. Non-Native distribution, by comparison, was 45% bachelors degrees, and 15% masters degrees (Gaylord, 1988).

A deeper look at the Native University of Alaska enrollment and degree awards reveals that Native college enrollees and degree awards are dominated by females at 75%. Male degree recipients dominate the non-Native categories by about 54% (Gaylord, 1992).

These low-participation and low-attainment levels reflect other factors, especially educational disadvantages, that contribute to this situation. Roughly half the Alaska Native population lives in mostly remote, predominantly Native communities, not connected by the state's road or highway system. These typically are small but wonderful places nestled in the big bend of a river, surrounded by spectacular mountains and forests, or perched along the great oceans and seas of Alaska's extensive coast, rich in game and in fish, each alive and wealthy in its local natural resources and particular Alaska Native culture. Small high schools operate in these Native villages, usually with a very small teaching staff who double as teachers in a variety of subjects. As a result, intensive advanced courses in the sciences and mathematics, for example, often are not taught in these schools due to limited resources.

Rural Alaska does not enjoy a diverse economy, thus significantly limiting the possibilities for the fostering of diverse career interests among high school students. Students generally have most direct, regular contact with teachers, not with engineers, journalists, biologists, doctors, nurses, archaeologists, chemists, linguists, and lawyers. Conceptualization by village students of career options or even of the possibility of choosing a future career generally is very limited.

Financial barriers to postsecondary education for Alaska Native students are also significant. The median figure for loans, grants, scholarships and financial aid to Alaska Native students enrolled at the University of Alaska 1992-93 is $22,119 compared to $12,136 for non-Natives (Gaylord, 1992).

The idea of going off to college to earn an academic degree may not yet be widely accepted among families in communities where few have done so. Most Native families who have members enrolled in colleges are, indeed, very supportive and most anxious to see success. The point is, however, that, relative to other segments of Alaska's population, few Alaska Natives seek degrees, although some indicators show a recent increase in overall college enrollment.

In 1982, Alaska Native leaders, not public school leaders, came to the University of Alaska Fairbanks to ask that a bold, if not unique, effort be undertaken to help find answers to the challenge to increase the matriculation and graduation rates of, specifically, rural Alaska Native high school students. In response, the Rural Alaska Honors Institute program, RAHI, ("raw-hi"), was organized by then University of Alaska Fairbanks Chancellor Patrick O'Rourke and University of Alaska Fairbanks Alaska Native Programs Director Dennis Demmert.

The Alaska State Legislature made a direct appropriation to RAHI for its initial summer 1983 program. Subsequently, those additional funds were made a part of the university's annual budget by the legislature, and the program is now a line item in the budget of the University of Alaska Fairbanks College of Liberal Arts. Alaska's rural schools and educators quickly and enthusiastically embraced the creation of RAHI as a college preparatory program for Alaska Natives.

An Overview of the Model for Addressing the Problem

In response to the Alaska Native leaders' request for a program to address the educational needs of their young people, RAHI first opened its doors the summer of 1983. A preselected group of college-bound rural Alaska Native high school students from many far-flung, remote regions of the vast state participated in a four-week program that summer, a pattern that, with added weeks, has been repeated each summer to the present. RAHI has recently grown to two concurrent seven-week residential programs serving a total of 46 students during the summer.

RAHI's students typically come from economically deprived environments: three out of five are from families with yearly incomes of $25,000 or less. A $25,000 annual family income is a low figure for Alaska's rural sector when faced with the very high costs of goods and services particular to the state. Students are not well prepared for academically rigorous study, and 49% of alumni parents did not attend or complete high school (Gaylord, 1989). The program provides academic and affective support to students who will be entering either their senior year in high school or their freshman year in college.

Student participants presently are awarded University of Alaska Fairbanks college credit for most RAHI courses successfully completed. The program allows just-graduated high school seniors and post juniors to start building university elective and core curriculum credits before they enroll in college as full-time students. The awarding of credit is a newer feature of the program. Students with the top academic records at RAHI also are awarded partial University of Alaska Fairbanks tuition waivers. College scholarship awards also are given, if any are available.

Each spring the program director recruits teaching and residence staff. They are either temporary, full- or half-time program employees. The program director and an administrative assistant are permanent, full-time employees of the university.

At the close of each summer session an internal evaluation of the program is made that attempts to measure student academic progress and achievement and attitudinal development. A broader in-depth review of the program through 1988 was completed but not yet updated due to lack of resources (Gaylord, 1989).

The RAHI program has also served as a direct model for a similar program, the Synala Honours Program, at the University of British Columbia in Vancouver. Three other somewhat similar programs, (two are now defunct), have operated at other colleges within Alaska. The Della Keats Enrichment program, a six-week summer institute for Native high school students who seek careers in health, currently operates at the University of Alaska Anchorage campus. The Upward Bound and new Upward Bound Math/Science programs — other types of summer bridge programs — also operate on the University of Alaska Fairbanks campus. Program emphasis, criteria for recruitment, and actual program structure differ between RAHI and these past and present models in Alaska models.

Resolving Access and Retention Issues Through Collaboration

Mathematics and writing are the centerpiece of the RAHI program. Students who will be entering their senior year of high school in the fall choose one of several career-based electives. Engineering, biology, business, education, anthropology, journalism, and the cultural and natural history of Alaska have been RAHI senior elective offerings over the past 12 summers. A team research project is linked to each elective. Teams make presentations of their project before a live audience at the program's end, enabling them to use newly developed communication skills. They also may elect to take a course in Native studies, and another, College Success Skills.

Students entering their freshman year of college in the fall enroll in University of Alaska Fairbanks freshman college mathematics and freshman English, or the remedial version of each, if their skill levels do not meet the gate levels for these courses. All RAHI high school senior courses and RAHI college freshman mathematics and English are taught by RAHI instructors hired primarily from University of Alaska Fairbanks department staff. Some RAHI freshmen arrive having already taken at least one or the other of these course offerings back home through the University of Alaska Fairbanks Rural College. They, and others who are able, also have the option to mainstream and enroll in the University of Alaska Fairbanks summer sessions courses while at RAHI, including the university's core curriculum offerings, thus earning credits that are required for a bachelor's degree. Other freshmen take the remedial versions of one or both, which are also the RAHI math and English courses offered to RAHI high school seniors. The remedial courses would otherwise have to be taken during the regular college fall and spring semesters.

In addition to academics, an important part of the RAHI program is attention to the affective needs of the students. A significant psychological barrier to postsecondary education for rural Alaska Native students is the very difficult transition from a remote community of close extended family support and cultural strength that typifies village life to living in a large western-urban campus setting. Many students have difficulty living comfortably with this change. Some students never stay long enough to learn how to cope with the college campus environment and leave within weeks of arrival. Others often leave at semester's end, either to seemingly never return, or to return later, sometimes to leave again but usually with the intent of eventually finishing a degree. Often such students leave to return home to help elderly grandparents or parents with subsistence hunting and fishing, or to provide other support needed by the immediate family back in the village. These departures, seen by many educators as unfortunate, are very understandable from the perspective of the rural families involved. In any case, college dreams cease to be realized in many instances.

RAHI includes evening and weekend recreational and cultural activities, including Native games and Native food nights. High school seniors and college freshmen choose either a swimming course or Tuma Native dance. Of particular note, the talking circle, added in 1994, is a counseling strategy adapted from the Plains Indians. Students are able to talk freely and confidentially among their peers. An Alaska Native elder lives with and supervises the residence hall staff and all of the RAHI students, also a new feature of the program in 1994.

A staff of tutor counselors who are University of Alaska Fairbanks upperclass persons are hired to live with the student, all of whom live and work together in one residence hall. A committee reviews and selects 40 to 45 students each summer. Students are elected from 75 to 90 applications based upon demonstrated academic achievement — a 3.0 GPA requirement is used as an application guideline — leadership, and desire to earn a college degree.

Students learn to live and work together in a campus setting at RAHI. Student family groups of eight to ten meet often together with a tutor-counselor family leader who serves as counselor, tutor, and mentor at program start. Required evening two-hour study halls are held Sunday through Thursday with teaching staff available in their offices, rotating different nights. Direct tutor-counselor and teaching staff contact maximizes opportunities for student encouragement and help with difficult course work. Although students are purposely stretched academically and even socially beyond their normal comfort levels, individual encouragement and support are given lavishly. A midterm and final "crunch" is created during which students experience the necessity to learn to schedule and budget time in crowded computer labs, trying to compete for limited numbers of computers so as to finish midterm and final assignments on schedule.

Many students encounter substantial, even severe homesickness while at RAHI. If serious problems arise with an individual resulting from this or other discomfort, the family leader is immediately aware. Efforts at encouragement, counseling, and peer counseling are quickly set into motion. Through working, studying, playing, laughing and living together, deep, strong friendships become part of a support network. Forming such networks is a major objective of the program. Powerful bonds develop with healthy, academically minded peers with whom students will later attend college.

RAHI students become familiar with all facets of campus living — the campus buildings, course registration, financial aid, the library, locations of professor's offices and buildings, crowded computer labs at critical moments, support personnel, inner-city transportation, bargain shopping, campus and city safety, strategies for eating, living in a residence hall with a previously unknown roommate, traveling safely on and off campus, daily college class schedules, the university computer network and e-mail, and time and personal financial management. They also meet with visiting Native practicing professionals and examine career options. Students learn to wake themselves in the morning, to become familiar and comfortable with meeting faculty during office hours and with working in study groups.

In program planning and execution, emphasis and careful consideration in planning are given to the importance of balancing a rigorous approach to academic achievement with respect and recognition of each person's primary cultural roots. Students are encouraged to maintain two parallel approaches: to keep and to value cultural beliefs and attitudes, and to be confident and relatively aggressive in meeting the academic and social challenges which characterize successful college life.

Rules of the program and appropriate behavior are fashioned for underage students, 16 to 18 years, and are specifically outlined in a student contract. Alcohol, drugs and tobacco products are strictly forbidden. There is a dorm curfew. Student governance is achieved through an elected student council that also serves as a student court. Class attendance is carefully recorded.

Concerns regarding academic performance problems of specific students are also reviewed at weekly meetings attended by all staff, thus alerting residence staff to instructors' concerns and vice versa. Students who continue to falter in meeting course work objectives are counseled and encouraged by tutor-counselors and instructors. If this intervention fails to bring about performance improvement, then an intervention group works with the student to develop and implement a specific plan of improvement.

Exit interviews are conducted at the end of the program. Each student and a staff person meet to discuss performance, standardized test scores, college concerns, and course work plans for seniors returning to finish high school. Promises and arrangements are made by students and staff to stay in touch.

Evidence of Success

Evaluation of RAHI has been done internally each year using program staff. Pre- and post-test mean score statistics were kept since 1984 for the ACT math test, and grade equivalencies have been kept for the Nelson-Denny Reading Test.

In recent years the Coopersmith Inventory Adult Form has also been administered to RAHI students but was discontinued after 1992 because funds necessary to analyze the data continue to be unavailable.

Formal evaluation of the program 1983-1988 has been completed by the Statewide University of Alaska Office of Institutional Research in 1990 (Gaylord, 1989). The author of this research moved on to the University of Alaska Fairbanks Office of Institutional Research and, although he shares in the desire to update this study, he has since moved out of Alaska, and no funds are currently available to perform this work.

This earlier assessment measures the impact of the program upon the students who have participated through 1988 and reveals trends and some early results. Gaylord shows that for the 1984-85 and 1985-86 academic years, 18% and 20% of RAHI, respectively, were still in school as compared to 3% and less than 1% of other Native students in the same cohorts. Also, 65% or more of RAHI alumni start out on-track in college as compared to 28% of high school seniors nationwide (Gaylord, 1989).

Significant increases in math and reading ability after attending the (then) six -week summer session are also apparent. The internally administered ACT post-math tests and Nelson Denny Reading test mean scores, 1984-1993, show impressive and statistically significant increases are made by RAHI students. Also, 95% of RAHI alumni find their participation in the program as "very helpful" in preparing them for college. Seventy-five percent enrolled in postsecondary courses since attending RAHI, and 92% state they unequivocally recommend RAHI to other students (Gaylord, 1989).

At this 13-year mark for RAHI, seven years after the Gaylord study, an updated version is much needed. Many RAHI alumni have earned bachelors' degrees in recent years since the study, with one or more also enrolled in or completing graduate study, but details and analysis are missing.

The program continues to receive much anecdotal praise from alumni, from rural school teachers who work with RAHI seniors who return home after the program to complete high school, and from Native leaders and others statewide. The program enjoys a high profile throughout Alaska and has received strong support from the University of Alaska Board of Regents and from the University of Alaska Fairbanks administration. However, financial support could decrease; the royalties from Alaska's North Slope oil fields account for more than 80% of the state's revenues, and these royalties have declined dramatically. As a result, the University has trimmed its budget and, in turn, cuts to the RAHI budget are possible. RAHI has managed to do more with less, but with cuts some program elements will suffer. Plans to make improvements are often unrealized, or sometimes undertaken on a small scale when a larger scale innovation would be more appropriate, all due to the overall budget squeeze. Among these are program review and evaluation.

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Chapter 7

Transitions: Building An Urban K–16 Continuum for Linguistic Minorities

by A. Patricia Jaysane

The Problem

Lawrence, Massachusetts is well known in the literature of urban distress, cited by the Greater Washington Research Center as the poorest city in New England and the 23rd poorest in the nation. It is densely populated with a decaying infrastructure designed to support an originally water-powered textile industry that vanished in mid-century. The old wood frame three-deckers are increasingly abandoned and then set afire, a by-product of the lucrative drug trade. The unemployment level is perennially one of the highest in the Commonwealth and the per capita income the lowest. Those needing the most in the way of services — over age 65 and under 18 — constitute half of the population.

Lawrence has been called the Immigrant City because the mills always attracted large groups of immigrants as workers. The most recent, currently making up at least 45% of the population, are from a number of Latino and Asian cultures, with the combined Latinos by far the largest number. Most of the immigrants are from the Dominican Republic, Guatemala, and Ecuador. There are also almost as many American citizens from Puerto Rico as there are immigrants from the Dominican Republic. There is a substantial refugee population from Cuba, Vietnam, and Cambodia. In fact, the large majority of the school population (82%) is a linguistic minority.

The Accept the Challenge program between Merrimack College (a Catholic institution) and Lawrence High School and the Merrimack College/Frost School (kindergarten through eighth grade) partnership began at roughly the same time, in 1986, through separate initiatives. Accept the Challenge was originally designed to address the dropout risk of bilingual students in a distressed urban setting. At the outset, the concern was to reduce the approximately 50% dropout rate. The partnership with the Frost School was triggered by the creation of a city-wide, adopt-a-school program and by a tragic fire that killed three Frost School children. Numbers of representatives of both business and college partners arrived at the school to assist in the coping process. From then on, the partnership responded to needs as they were perceived, the most significant of which was the discovery of alarming attrition taking place between students' departure from the Frost school at the end of eighth grade and the end of ninth grade.

The partnership between Merrimack College, public schools, and others in the City of Lawrence evolved from a series of intersecting programs that had as a common theme — transitions. At the outset, there was no far-reaching vision, only interventions designed to solve or help solve specific problems. The theme emerged as we progressed and found ways that innovations could be reused in different settings and as we entered the long, unfinished process of realizing that a successful outcome at one stage of the kindergarten through college ("K-16") continuum is, in essential ways, a benefit to all other stages.

The Model

Accept the Challenge responded to the specific need in the community by designing a program that fit into the Upward Bound parameters of the Massachusetts Educational Opportunity Program through which the college sought funding. The required framework was an after-school program, a summer residency program, counseling and academic components, and a student stipend of $25 per week. The partnership with the Frost School at first followed the general pattern of contributing mutual resources without seeking outside funding. Specific activities were funded as we progressed, however, by the Xerox Foundation, Nellie Mae, the Jessie Cox Charitable Trust, the Lockheed Leadership Fund, and the Artemas Stearns Foundation.

Accept the Challenge was designed by teachers and professional staff of both Merrimack College and Lawrence High School. The general target of our efforts was students in the Transitional Bilingual Education program. The partners agreed that the program would provide enrichment activities to improve skills and move students more quickly through the Transitional Bilingual program into mainstream courses, and the specific target was those students who in some way demonstrated academic promise. This promise was not necessarily manifested in grades or test scores, which are often low for bright students facing multiple obstacles in addition to the linguistic. Sometimes a teacher saw a talent, or an interest in an area tangential or even irrelevant to the class. The Accept the Challenge program provided an outlet for those students.

After the mutual planning, implementation, and assessment of the first two years, collaboration focused on selection of students and on shared efforts to help students get into college. Students must initially be recommended by their teachers and guidance counselors. With only about 16 available slots per year, and more than 100 applications, the selection process required substantial interaction between school and college staff.

Unlike Accept the Challenge, the Frost School partnership had the capacity to reach all of the 1200 kindergarten through eighth grade students, most of whom are linguistic minorities, through a variety of recreational, mentoring, and academic activities. The partnership featured a Career Awareness week and after-school program funded by Nellie Mae (a fund for education), summer programs, volunteers in the library, writing workshops and the High School Transition program. Also unlike Accept the Challenge, collaboration has been integral to every activity, even to the involvement of Accept the Challenge students in the after-school, mentoring, and Transition programs. Moreover, the partnership has involved not only the college and the secondary school, but also a number of businesses and community organizations, including Baybank, Continental Cablevision, Marshalls, Merrimack Paper, and Family Services Association of Greater Lawrence.

Access and Retention

Accept the Challenge quickly evolved into a vehicle to move students beyond high school into college. The program is designed first to improve English and strengthen the cultural orientation of the students. Part of this process involves developing the kinds of study skills in all subjects that are peculiar to that aspect of American culture that locates students in the college pipeline. The program also involves career orientation that includes informing students from other cultures about the specific kinds of careers available in the U. S. All these things become part of the academic component. The basic activities are also organized according to the same principle. The program has been refined, however, to offer opportunities for leadership development and to make Accept the Challenge part of a systemic effort to revise the K–16 curriculum.

All activities are integrated within the framework of the teaching and learning of English. The pedagogical theme from beginning to end is a concentration on the goals of students and on the means of moving them from where they stand to where they want to be with respect to their academic goals. All their activities are viewed as either overcoming obstacles to their goals or, negatively, placing new obstacles in the way. Thus, although the program focuses on English and cultural skills, the academic component provides the base for counseling efforts designed to keep students in school, succeeding in courses, and going on to higher education.

The academic year program for first-year students, usually ninth and tenth grades, is divided into two parts. In the beginning, students are encouraged to look at themselves in relationship to their surroundings and to focus on achievement, becoming more daring in their contemplation of career choices. The principle is that they must first search for their identity, become comfortable with that, and learn to use their strengths appropriately.

One of the first activities is an orientation exercise using a Lawrence street map. The students identify landmark locations and their own homes. Then they develop strategies for getting from one place to another. Not only is the exercise a good vocabulary builder (distance, direction, etc.), but it is used as a metaphor for the entire program. The students are encouraged to find out who and where they are in relation to others and then how to get from where they are to where they want to be. We progress to problem-solving exercises that encourage observation and analysis. Although some exercises have been technical or scientific, such as bridge building, others have led students to the same skills through observing art.

Although these activities are used to build language, observation, and quantitative skills, they are also designed to help students identify what their interests are and to explore how these interests may be transformed into college and career opportunities. A characteristic of the program is that the students have been quite diverse in their choices. In addition to mathematics, science, engineering, and business, a number use their talents in art, dance, and music, often in combination with another major.

In the second half of the academic year program, the focus shifts from individual achievement to individual responsibility. Not only are the students reminded of their own goals and means of achieving them, but they are shown the importance of interacting constructively with other people so that all may accomplish goals. The students learn more about American history and literature during this time. In teaching these important cultural references, the program focuses on choices that were made, the reasons for those choices and the consequences. This focus on community responsibility led Accept the Challenge to interaction with the Frost School partnership.

The summer program includes more formalized training in English, mathematics, social sciences, and sciences, supplemented by sports and cultural orientation activities in the afternoon and evening and by field trips for one day each week. The partnership has written a textbook for social sciences. In addition, all students read one literary work during this period. They have a choice of books that vary in subject matter and complexity. A set of questions provides an individualized "guided tour" through the book. Faculty members from the Chemistry and Physics Departments of Merrimack give mini-labs. A faculty member in Political Science focuses on how to ask a question and conduct inquiries into various kinds of answers.

Because of the particular interests of two of the teachers in Accept the Challenge, a drama component was added to the program. All of these students are non-English speakers, but they developed their English skills to a point at which they performed in English in front of an audience that combined parents, teachers, students, and friends.

Although the summer program results in the most dramatic development for students, there are, nevertheless, substantial barriers to convincing students and their parents that students should remain on campus for six weeks during the summer. One is the reluctance of parents in cultures with very strong family ties to let their children stay away during the summer. Another reason is that parents frequently take their children back to Puerto Rico, the Dominican Republic, or to Ecuador during the summer. Still another is that students are needed at home to take care of siblings while the parents are working. In fact, two students had their own children. Some students also need to take summer school. Finally, students must often make the difficult choice between participating in the summer program or earning more money in summer jobs, jobs that their families may well depend on.

The partnership has addressed these problems in several ways. First, the partnership adopted a more flexible plan, enabling students taking summer school, caring part-time for siblings, or working at part-time jobs to be released for part of the day to do so. Members of the partnership used personal cars to transport the students to where they needed to go. They completed academic work on a schedule different from the other students, but participated in activities. In some cases, parents would not allow their daughters to stay overnight. In response, their daughters were picked up and delivered each day, as was a young woman who needed to return to her toddler at night. As further incentive for students who were participating all day in the program the High School Transitional Program with the Frost School provided them an extra stipend.

As Accept the Challenge was directed more toward assisting students with navigating transitions into college preparatory courses and into college, Frost School students had to wrestle with transitional issues as well. The *Focus in Transition* (FIT) program, a collaboration of Merrimack, the Frost School and the Family Service Association of Greater Lawrence, aids students in the risky transition between middle or junior high school and 10th grade. A disproportionate number of these dropouts occur in 9th grade. This program, which has been partially implemented on a pilot basis, is designed to demonstrate students' own control in achieving goals, to prepare them to cope with negative pressures, and to teach them how to maintain focus.

The initial stage was a week-long High School Transition program during the summer collaboratively planned and implemented by Merrimack, the Frost School and Family Services. The program, entitled "Where in the World Are We?", is intended to teach students who have just graduated from eighth grade to navigate in new surroundings and underscore the goal of completing high school and entering college. Activities include self-awareness exercises, a collaborative art project depicting Lawrence, and a high school tour and panel discussion on high school academic and social concerns conducted by Accept the Challenge students. After spending part of one week preparing, these Accept the Challenge students work 25 hours as peer tutors to the eighth graders. They help them with career orientation and self-esteem activities and organize a tour of the high school to reduce the anxiety of students who will be attending in September. The benefits of having Accept the Challenge students work with the eighth graders include:

1. Eighth graders make social contacts in high school.
2. Eighth graders hear answers to real questions that adults cannot always predict.
3. Eighth graders learn that students are not socially rewarded for nor necessarily pressured into using drugs and alcohol.
4. Accept the Challenge students increase their self-esteem by being role models for the younger students.
5. While passing on their knowledge to the younger students, the Accept the Challenge students are unconsciously having the lessons reinforced in themselves. Accept the Challenge students have been recruited as aides in the summer and after-school program and as peer tutors and mentors. This enables them to work with grades one to six as well.

After the second week-long summer program, the Frost School Guidance Office and the Family Services Association of Greater Lawrence collaboratively developed guidance classes for seventh and eighth graders. These enable students to express concern about "fitting in," "peer pressure," "gangs," and "drugs and alcohol" in addition to the reality that high school is academically more difficult. They also prepared the eighth graders to gain the maximum benefit from the activities with the Accept the Challenge students, soon to be their peers in the high school. Other activities include a career awareness program for eighth graders. This began as a collaboration between the Urban Institute and the Frost School, but has been assumed now by a business partner.

A third stage, planned collaboratively by Merrimack College's Urban Institute and the Frost School, was piloted for two years. The program featured a guidance professional from the Frost School who spent one day per week at the high school working with the ninth grade former Frost students who were experiencing difficulty. The guidance professional also helped the high school teachers become more familiar with the incoming students. The underlying presumption of the program is that if the more nurturing connections developed in the younger grades are used to prepare students socially as well as academically for high school, and if these connections are sustained during the period of greatest risk at the high school; students will have a better chance of maintaining focus and staying in school. It is a simple idea, but one that is not incorporated in standard school structure, which stresses division rather than continuity among the three precollege levels.

As much as possible, the school-college partnership attempts to address needs from kindergarten through eighth grade, not only to fill gaps, but to inform the college where it needs to improve its preparation of those planning to teach. In particular, science education for prospective elementary school teachers is crucial.

The RAISE program (Resources to Accelerate Integrated Science Education), funded by Eisenhower Title II and Lockheed grants, works with teachers in kindergarten thought sixth grade, who usually have little or no background in science, to develop confidence in conducting hands-on experiments with their students. The teachers are trained by Merrimack College science faculty to do experiments associated with the science concepts appropriate to the different grade levels and are provided with equipment and materials needed to conduct those experiments. After they have completed the experiment in the classroom, they report back to Merrimack on the results (such as children's responses, problems, and how the experiment was integrated into language arts and other disciplines).

During the summer, a science camp is held on Merrimack's campus. This program, free to the participating students, has several purposes. One purpose is to provide an opportunity for students completing grades three, four, and five to have a recreational experience with science and mathematics in order to generate interest and confidence. Another purpose is to enable teachers who have participated in the Integrated Science Seminars to reinforce what they have learned by conducting experiments with groups of students under college faculty supervision. Thirdly, the program involves advanced Accept the Challenge students as assistants in conducting experiments, with the result of providing peer mentoring and role models for the younger students and additional leadership opportunities for the older students.

Another activity has been the writing program developed through a complex collaboration of Merrimack's Urban Institute and Writing Center with Phillips Andover Academy and the Bread Loaf Writing School at Middlebury. This program began as a six-week workshop for teachers to train them to encourage student writing as an outlet for the emotions and perceptions created by a distressed environment and as a vehicle to build confidence, rather than as an academic exercise that could be associated with failure. Merrimack's unique contribution since 1989 has been the involvement of five different undergraduates in each summer workshop who train with the teachers and, as part of the training, working with groups of students from Lawrence to help them gain a sense of joy through their writing. During the academic year, the Merrimack undergraduates work with teachers at the Frost and other Lawrence schools to set up and conduct writing workshops for the students.

Evidence of Success

During the 1991-92 school year, while exploring the potential need for a Transitions Facilitator, it was discovered that, by the end of the second quarter only 40 of the 159 students who completed the Frost School's eighth grade were enrolled at the high school. What happened to the other students is not known. Of the 40 remaining at that time, only 10 were passing. The other 30 were failing one or more subjects when first identified in November, 1991.

Figure 1 represents the attrition in the high school by grade in the 1991-92 academic year. Dropouts are disproportionately represented in ninth grade. In this eight month period, the ninth grade has lost nearly 26% of its students. The graph also suggests that persistence through ninth grade reduces the risk of dropping out, given that in tenth grade the attrition rate is 14.5%, in eleventh grade about 12%, and in twelfth grade negligible.

As of September 25, 1992, as a result of the first year activities, all of the 161 students who completed the eighth grade at the Frost School in 1992 were accounted for, all were enrolled in some school, and 92 of these students were enrolled in the high school. Moreover, at the end of the second quarter, 35 were receiving honors, representing a third of the honor recipients of

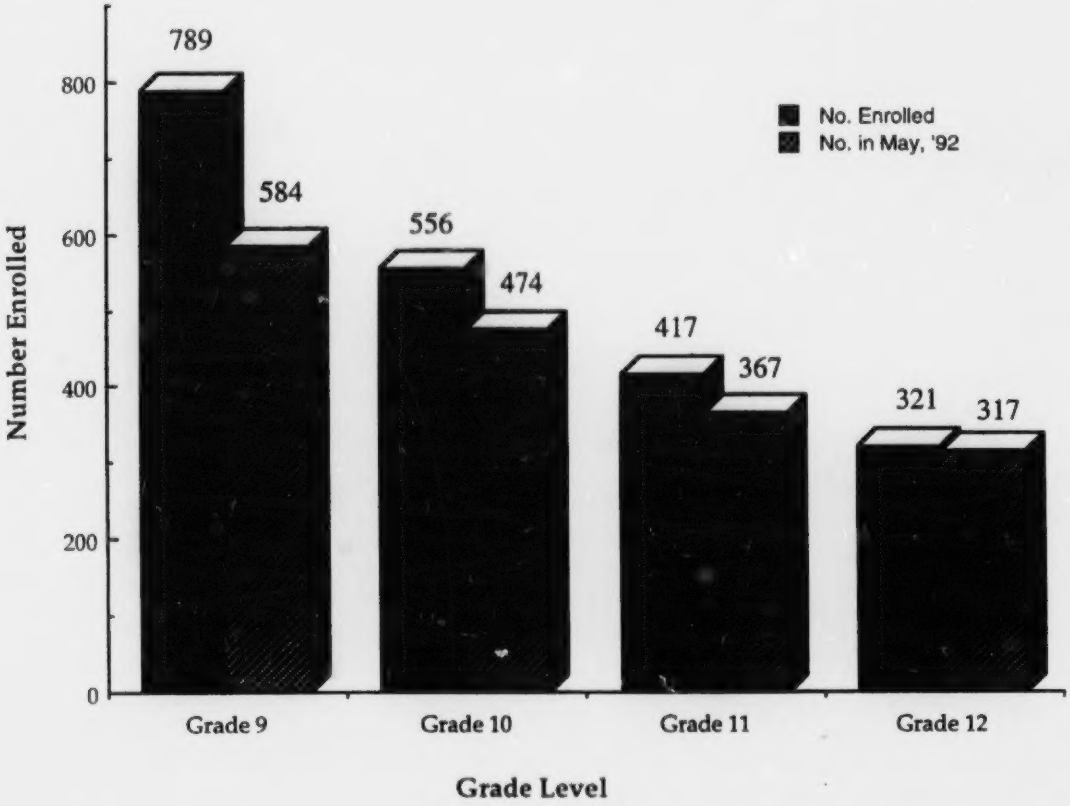

Figure 1: Lawrence High School Drop-Out Pattern, 1991-92

the entire ninth grade. There were about 15 failing one or more subjects, but all of them were working with the Transitions Facilitator and finding help.

More students are participating in science through the RAISE program. Thus far, 46 teachers have completed the Integrated Science training, and approximately 1200 students have participated in 16 to 24 hands-on experiments as a result of the program. Further, 100 students have participated in one of two free week-long summer science camps in which they conducted experiments organized by teachers under supervision of Merrimack faculty.

Twenty-five Merrimack undergraduates have had the Writing Workshop training and have then developed workshops for over 1,500 students in Lawrence. Students in grades three through six have produced books of poetry, stories, and descriptions as part of these workshops.

Since 1989, all Accept the Challenge students who attended the program for more than one year have graduated with their classes. Of the 75 seniors during that six-year period, all but three went immediately on to postsecondary education, yet one of these three enrolled in a local community college one year later, and another, who graduated in 1991, went on to attend college part-time in Fall, 1994. Students have attended colleges throughout Massachusetts and are now also going to colleges in other states. In addition to regional community colleges and state colleges and universities, they have attended such institutions as Middlebury, Mount Holyoke, and Simmons. Thus far, 29 have enrolled at Merrimack.

In 1990, Merrimack responded to the severe financial barrier to college by instituting a full four- year scholarship, including tuition, fees, room, board, and books, for all Accept the Challenge students who participated in the program for at least two complete years and who met admissions standards. This plan was developed to address the failure of partial scholarships and heavy loan obligations to retain students who might not be able to reconcile a college education and the financial needs of a family. The room and board component is also intended to respond to this concern as well as to permit appropriate study time and space.

In 1994, the first four students enrolled at Merrimack under this program graduated. One additional student who entered with the four in 1990 transferred after two years to a college that offered a major in chiropractic medicine. The result, based on this initial, admittedly small sample, is a very high retention rate, with the one student transferring rather than dropping out. We believe that this record is due not only to the precollege preparation but also to attention given to the transitional needs of these students as they move from a native ethnic environment to a different, largely homogeneous ethnic environment. These students, however, benefited from a continuing familiar adult presence among faculty, administration and staff. They had met college personnel during the residency programs in high school and could still turn to them for assistance as they navigated sometimes bewildering channels of registration, class expectations, paperwork deadlines, and campus culture. It is more difficult to track the success of those who are attending other colleges, but all of the fourteen heard from in the past year are still in college or, in the case of two of them, have just graduated.

The partnership seeks a complex of programs that will smooth the transitions in K–16 education, not only between educational levels, but also between school and work. Part of this process is instilling in students a yearning for personal achievement and a sense of obligation to make that achievement a benefit to the community. The programs have targeted mainly minority students from disadvantaged financial backgrounds living in a distressed city. However, the goal of making smooth transitions is important for all students moving toward and through higher education in the future.

Chapter 8

The Rhode Island Tech Prep Associate Degree Program: Refocusing the Goals of General Education Programs

by Patricia Neri and Cheryl Serra

A Problem that Brought Collaborators Together

The Rhode Island Tech Prep Associate Degree Program is designed to offer high school students an alternative program of study that is goal-oriented, focuses on basic academic skill development in math, science, and communications, and prepares them to succeed in the increasingly technological world of work that awaits them. The Tech Prep Program allows students the opportunity to explore and prepare for careers in three areas: technical programs, allied and dental health, and business and office administration. The Tech Prep Program is aimed at the vast majority of students who are enrolled in unfocused general education programs (i.e., programs of study that prepare them for neither work nor college). The Rhode Island Tech Prep Associate Degree Program is one of 1200 such programs nationally (Laura L'Esperance, July 1994, Center for Occupational Research and Development, Waco, TX, personal communication).

The 1985 publication of *The Neglected Majority* served as an impetus to develop a Tech Prep Associate Degree Program at the Community College of Rhode Island. In this book, Dale Parnell (1985), author and former president of the American Association of Community Colleges, brought to the foreground the problems associated with focusing educational efforts only on students at both ends of the educational spectrum. There were those students who were certain to continue their education at a four-year institution, and they were appropriately placed in college preparatory courses. Then there were the students who would not likely continue their education; these students were placed in vocational programs which focused on occupational skills aimed at preparing them to enter the work force directly from high school. But what about the others? Where did they go and what did high school prepare them to do? Nowhere and nothing, according to Parnell (1985). Yet, these students, "the neglected majority," are enrolling in increasing numbers in general education courses that prepare them for neither work nor a vocation. They pass their time in classes that have no relevance to their future.

Once the Tech Prep Program was identified as one that would benefit Rhode Island students, Community College of Rhode Island President Edward J. Liston knew that if Tech Prep was to be transformed from educational ideal to Rhode Island reality, he must foster a statewide familiarity with the Tech Prep concept. He believed it was also essential to garner support for the educational initiative from people who could set the policy that would pave the way for Tech Prep's implementation in Rhode Island.

To this end, an informational meeting was scheduled and hosted by President Liston and other individuals from the community college. Those in attendance at this informational meeting included representatives from the Office of Elementary and Secondary Education and the Office of Higher Education, Rhode Island legislators, representatives from the Board of Governors for Higher Education and the Board of Regents for Elementary and Secondary Education, and members of organizations who had expressed concern with the high school dropout rate in the state, such as chambers of commerce and Rotary Clubs. Author Dale Parnell was the keynote speaker.

At this meeting President Liston attempted to gauge whether these individuals accepted the concept of the high school-community college partnership model proposed by Parnell. Liston decided that it did not make sense to begin the dialogue with potential Tech Prep instructors, for instance, if these policy makers found the concept to be flawed or the goal for some reason unattainable.

But those in attendance embraced the concept of developing and implementing the Tech Prep Associate Degree Program in Rhode Island. With statewide, top-level support for the Program, President Liston formed a steering committee comprised of individuals who had attended the first informational meeting. The steering committee was charged with overseeing a plan for program development and implementation. At that time, the steering committee decided that rather than target one school district, as other states were doing, the Community College of Rhode Island would target the entire state of Rhode Island with its 39 school districts. The steering committee felt that in order to make a significant positive impact on the "general studies" non-college bound student, it would be necessary to involve as many high schools as possible in the Rhode Island Tech Prep initiative.

A strategy evolved that encompassed a statewide constituency. The plan that was developed and carried out consisted of the following activities:

- An informational conference was organized for superintendents of the school districts as well as the individual building principals in order to introduce them to the Tech Prep concept.
- Using the list of interested school administrators, another conference was held for guidance counselors, high school teachers, Community College faculty, and administrators from the high school and Community College.
- At the close of the conference, a joint steering-curriculum committee was established on a voluntary basis.
- Once the curriculum committee had developed a model Tech Prep program, another conference was scheduled. Superintendents and principals from throughout the state were again invited, this time to review the proposed curriculum and program design. The model was presented and seven high schools volunteered to begin the program in the fall of 1987.

Since the Rhode Island Tech Prep Associate Degree Program is one of the most mature Tech Prep programs in the country, many people interested in tech prep have looked to the Community College of Rhode Island (CCRI) for assistance. Several on-site visits have been hosted by CCRI and have been aimed at providing educators with the opportunity to learn more about CCRI's model program and to observe high school Tech Prep classes in session.

Educators from states such as South Dakota, New Jersey, Massachusetts, Virginia, Pennsylvania, Iowa, and New York, as well as from Australia, have visited the Community College of Rhode Island and participating Tech Prep high schools during several scheduled on-site visits. In addition, the Tech Prep director and staff have made presentations all over the country, including Massachusetts, New York, New Jersey, Colorado, Washington, DC, New Mexico, Kansas, Illinois, Wisconsin, Louisiana, and Texas.

Further assisting those people interested in implementing a tech prep program is a kit of Rhode Island Tech Prep promotional materials which have been developed and disseminated nationally. This project was funded by a United

States Department of Education Demonstration Grant for the Integration of Academic and Vocational Education. Included in the information kit is a "How to Implement" guide aimed at assisting educators who are considering tech prep program development and implementation. This guide demonstrates, step by step, Rhode Island's process for program implementation and development and also discusses some of the potential barriers to such program implementation and how to resolve these issues. (If you are interested in receiving the Rhode Island Tech Prep Associate Degree Program information kit, please call the Program at (401) 825-2143, or send your request in writing to RI Tech Prep Program, Community College of Rhode Island, 400 East Avenue, Warwick, RI 02886-1807, or telefax your written request to the Tech Prep Program at 401-825-2265.)

The Tech Prep Program addresses the needs of students who are not planning to attend a traditional four-year college or university at the completion of high school but have the ability to successfully complete the requirements of an associate degree program. Vocational students may also be served by the Tech Prep Program. In addition to the occupational, hands-on skills these students would typically acquire in a vocational program, Tech Prep students are also enrolled in a stringent, sequential program of study that demonstrates the connection between the theory and practical application of what they are learning.

After two years of planning, the Rhode Island Tech Prep Associate Degree Program was initiated in 1987 when seven high schools throughout the state formed a partnership with the Community College of Rhode Island. The Program has grown over the years both in the number of participating schools and in the areas of study available to Tech Prep students. During the 1994-95 academic year, approximately 78% of the state's 47 public secondary schools are expected to be involved in the Program. Efforts to increase the number of participating high schools are ongoing. In the spring 1994 semester, 1,452 secondary school students were enrolled in Tech Prep at the secondary level, and 203 Tech Prep students were enrolled at the Community College of Rhode Island. In the fall 1995 semester, there were 1,551 students were enrolled in the program, and 282 Tech Prep students enrolled at the Community College of Rhode Island.

The goal of the Rhode Island Tech Prep Program is to provide students with a focused course of study while in high school, a program that aims to motivate them while at the same time laying a foundation of knowledge and skills which may be expanded upon at the postsecondary level. In addition, eligible Tech Prep high school students in the office and business administration programs have the opportunity to earn community college credits while in high school. Because it is a goal-oriented program of study, the Tech Prep Program has the potential to give the less motivated student an incentive to finish high school and eventually complete the requirements of a two-year college degree or other postsecondary training program.

Tech Prep courses offered throughout the state include Principles of Technology, Mathematics for Technology, Applied Communications, Applied Biology/Chemistry, Workplace Readiness, and selected college-level business courses.

The Tech Prep curriculum is a focused curriculum that places its emphasis on building the skills and knowledge that will meet the challenge of new careers resulting from the emerging high tech information processing revolution. Students selected for the program are those who would respond positively to an applied or activities-oriented curriculum. The Tech Prep curriculum is learner-centered and offers students the opportunity to see how what they learn in the classroom relates to what they do every day and in the world of work. For instance, an Applied Communications lesson which focuses on starting a new job points out to students the importance of gathering critical information about a potential job during the interview process. The lesson categorizes this information in the following manner: working conditions; job-specific training; rules, policies, and procedures; physical needs; and compensation. Students are also urged to determine the expectations of a potential employer. An assignment at the end of this lesson calls for students to identify a specific job in an occupational area which interests them. Using a chart which lists these previously mentioned categories, students are asked to state all they know about a particular category (i.e., compensation, working conditions), what they need to check further, and questions to ask in order to gain the information they need. A follow-up lesson calls for the student to select a local company and set up an interview with the employer or a person employed in the job in which the student is interested. During this interview, the student is instructed to follow the format used in the previous assignment and to take notes during the interview. After the interview, the student summarizes the activity in writing.

A Principles of Technology lab calls for students to measure the linear rate of an object moving on a conveyor belt, therefore allowing them to measure the production rate of objects coming off the conveyor belt. Such "real life," hands-on labs provide students with clear goals so they know why they are learning particular subject material. Traditionally, teachers in a classroom taught while students were passive learners; Tech Prep is a more participatory learning experience, with teachers taking the role of facilitator of student learning. Studies indicate that students are more successful when they see a "connectedness" between what they learn in school and how this knowledge is applied in the real world.

The Tech Prep Program helps students develop skills in problem-solving, communication, technical writing, and critical thinking — skills that are crucial in any of life's endeavors. These are also skills which have been identified as necessary in What Work Requires of Schools, a report prepared by the Secretary's Commission on Achieving Necessary Skills, U.S. Department of Labor. Career exploration and development are also important elements of the Tech Prep Program. The Tech Prep Program involves students in activities that promote educational and career development and enable them to become lifelong learners and capable employees in the increasingly competitive global marketplace.

With regard to the curricula, the Rhode Island Tech Prep Program uses materials developed by the Center for Occupational Research and Development (CORD) and the Agency for Instructional Technology (AIT). The Rhode Island Tech Prep Program piloted the curricula and adapted it to the needs of each participating school system. Since the time that Rhode Island implemented the Tech Prep Program in 1987, other applied curricula have been developed by a number of publishing companies.

Students who successfully complete the requirements of the high school portion of the Tech Prep Program receive a certificate of completion and are guaranteed acceptance into specific programs at the Community College of Rhode Island. There are three areas of study involved in the Tech Prep Program at the community college: technical programs, allied and dental health programs, and business and office administration programs. Several certificate and associate degree programs of study exist in each of these areas.

In Rhode Island, high school students are identified for the Tech Prep Program through a collaborative assessment by high school teachers and counselors. The following guidelines are utilized for selecting potential Tech Prep students:

- student report card — four-year college prep students who are not succeeding and strong non-college prep students are candidates;

- portfolio — assess past performance for strengths and weaknesses;

- standardized test scores — Metropolitan Achievement Test scores in the 40 to 60 percentile range;

- career interest assessments — review results to determine interests;

- teacher recommendation — teachers may recommend a student for Tech Prep based on their experiences with students in the classroom.

The characteristics of potential Tech Prep students include: (a) enrollment in unfocused general education programs; (b) underachievement in proportion to their abilities; (c) disinterest in their classes and the tendency to take the easiest courses offered; (d) a lack of direction and interest in school that leads to greater likelihood of dropping out; and (e) a greater likelihood of enrolling unprepared at a community college or technical school.

In addition to the careful recruitment of students for the Tech Prep Program, a number of activities are aimed at making their transition from high school to the community college a smooth one and are intended to assist students in their becoming successful while at the community college.

In an effort to keep Tech Prep instructors, counselors, and administrators apprised of any changes in course or program offerings or curriculum, or to discuss any questions or concerns with the Program, staff development and in-service workshops are also regularly scheduled. The following is a sampling of the activities that have been scheduled in recent years with these goals in mind:

- Tech Prep Summer Institute — This activity, which has been scheduled prior to the opening of school, occurs over two consecutive days. The first day of the Institute consists of workshops on topics of general interest. Some of the workshops in the past have been entitled "Establishing Partnerships with Business and Industry," "Implementing Tech Prep" and "Dealing with Gender and Cultural Issues in the Classroom." The second day of the Institute is devoted to subject-specific, in-service workshops. At this time, for instance, a team of Principles of Technology instructors may demonstrate labs which they have created and/or modified and which have been successful in the classroom. Participants brainstorm and share information.
- Guidance Counselors' Orientation — Each year, a guidance counselors' orientation has been scheduled and held at the CCRI. The objective of the orientation is to familiarize new high school guidance counselors with the Tech Prep Program, to update the counselors on any changes in the program, and to address and discuss on a personal basis any questions or concerns the counselors may have. Counselors are also given a tour of CCRI and an opportunity to view firsthand the college's technical labs and programs.
- Tech Prep Educators in Industry Tours — These are tours of local businesses which provide Tech Prep educators the opportunity to see firsthand a high performance workplace. In addition, participants gain information about what sort of skills and competencies such workplaces require of their employees. The information the Tech Prep educators gather through these tours allows them to keep current about what is occurring in today's high performance workplace and also allows them to share this information with students who will be making career decisions. Curriculum revision aimed at meeting workplace demands is another objective of the tours.

Evaluations of Tech Prep activities are conducted on an ongoing basis. Results of these evaluations are used to improve and expand activities so that they may better serve participants.

To assist with student recruitment, Tech Prep staff at CCRI are available during the school year to participate in student and parent orientations at the high school as well as to provide guidance, counseling, and support services. Activities for Tech Prep students, teachers, counselors, and administrators are also scheduled regularly.

While in high school, Tech Prep students visit CCRI on three occasions. The first visit, which takes place in the fall of each year, is planned to introduce students to the college and faculty and to provide them with a general overview of the Tech Prep programs that are offered at CCRI. Students receive information concerning career opportunities in technical fields and complete an interest assessment so that they may begin to relate their interests to possible educational and career opportunities. Students also tour the facility and visit the technical labs to get a firsthand look at the programs offered at the college.

In January, a senior luncheon is scheduled. At that time, high school Tech Prep seniors attend workshops at CCRI that address the college application process and financial aid; a general college orientation is held at this time as well. At the senior luncheon, students complete a math assessment and meet with counselors to discuss the results of the test and the implications for future course selection.

In the early spring, students return to CCRI for a full day of activities including demonstrations and hands-on activities in the various technical labs, meetings with employers from various technical industries and businesses, and workshops that address job skills and decision-making skills.

An early registration day is held in April for those seniors who intend to enroll at CCRI the following fall. These students are allowed to register for fall classes weeks ahead of other incoming freshmen. Students who take advantage of this opportunity are able to create a schedule that best fits their needs, as most classes are still readily available. In addition, the application fee is waived for all Tech Prep students applying to the college. These are some of the ways that the college demonstrates its commitment to the Tech Prep Program.

In addition to these scheduled activities, high school seniors are invited to shadow CCRI students who are enrolled in technical programs at any time during the school year. All of these activities help to increase students' awareness of career opportunities and the educational requirements needed for successful pursuit of an associate's degree and a career in one of the many technical fields highlighted in the Rhode Island Tech Prep Associate Degree Program.

At the postsecondary level, a full-time Tech Prep coordinator is available to assist students with program and course selection and to provide any other assistance that they may need in making the transition from high school to the community college. The coordinator contacts Tech Prep students who are enrolled at the college at the beginning of each semester to schedule advising and counseling sessions. She also serves as a liaison between faculty and students and further assists students by referring them to additional resources within the community college.

Finally, Tech Prep students at the college are invited to attend a number of workshops scheduled throughout the academic year. These workshops address issues that are pertinent to community college students, such as study skills, time management, financial aid, and work-readiness skills.

In addition to the support services provided to Tech Prep students by program staff, a number of other resources are available at the community college to assist students in meeting graduation requirements. Access to Opportunity offers supportive services to students who are low-income and "first generation" students, (neither parent graduated from a four-year college), or have a disability. Students who have the academic potential but whose specific needs may interfere with their success in college may benefit from Access. The Access staff includes counselors, tutors, and support services personnel. The goal of the program is to aid students in making a successful transition to the academic, social, and emotional life of the college.

All Access students receive academic advising, financial aid advising, adjustment counseling, transfer counseling, and tutoring. They also participate in career exploration activities. Students with disabilities may receive support services such as sign language interpreting, note-taking, academic accommodations, and training on and use of adapted equipment.

New Careers for Women, another program at CCRI, provides support services and job placement assistance for women enrolled in the following technical fields: chemical technology, computer engineering technology, electronic engineering technology, electronics, engineering, instrumentation technology, machine design, machine processes, and mechanical engineering technology.

In addition to these programs, Project Sphere is a resource and referral center for single parents and homemakers entering retraining and education programs. The center provides bilingual counseling services for Hispanics, Laotians, Hmongs, Cambodians, Vietnamese, and others.

Tech Prep students who enroll at CCRI may also take advantage of the college's Cooperative Education Program. Through Cooperative Education, students are involved in paid employment that is directly related to their career majors while simultaneously earning academic credit toward an associate degree. These experiences help students to learn more about a particular occupation as well as to clarify career goals.

As part of the Cooperative Education experience, students participate in a seminar that focuses on self-discovery, career analysis, communication styles, and career development, and are concurrently enrolled in a supervised work experience. While working, they earn competitive wages in positions related to their academic major. College faculty help them to integrate classroom learning and the world of work. Credit is awarded for successful completion of the cooperative work experience and related academic requirements.

The Career Placement Office of the Community College of Rhode Island provides Tech Prep students with job placement services upon completion of their program of study. Job placement for graduates of some technical programs is currently near 90%. Many Tech Prep students are recruited for employment from the community college before they even complete the requirements of a two-year college degree.

In addition to serving the diverse needs of Tech Prep students, the Tech Prep staff also addresses the needs of Tech Prep educators through staff development and in-service workshops which are scheduled regularly and serve multiple purposes. Chief among them is ensuring that Tech Prep instructors are kept up-to-date on curriculum and teaching methods. These workshops also provide an opportunity for instructors to share their experiences in the classroom and to exchange ideas about Tech Prep. Both seasoned and novice Tech Prep staff benefit from these activities. Those who have more experience in teaching Tech Prep courses can share some of their successful teaching techniques as well as solutions to problems that they may have encountered. The newer staff members are able to reap the benefits of their colleagues' expertise, and because they are coming to the program with a fresh perspective, they may offer new insights into the program. These activities facilitate communication among educators, offer the opportunity for professional liaisons which may not otherwise occur, and encourage and support professional development.

In 1992, the U. S. Department of Education awarded the Rhode Island Tech Prep Associate Degree (TPAD) program a $312,657 grant to develop an evaluation of the methods employed to measure the program's effectiveness. Based on eight years of program management, the assertion was posited that students who participate in the TPAD program are more successful in secondary education than non-TPAD students, as evidenced by their performance in core subjects; and students in the TPAD program participate in postsecondary education more frequently.

The project evaluation employed a comparison group design, and 1,350 eleventh and twelfth grade TPAD students from 24 high schools in Rhode Island composed the Tech Prep sample group. A comparison group was composed of 235 similar students from TPAD schools whose guidance counselors identified them as appropriate candidates for the TPAD program, but who had declined to participate, and two non-TPAD schools whose faculty were planning to implement the program in the next school year.

Existing performance information was collected from student files for demographic and performance information for all participants. Data were analyzed using t-tests and chi-square methods to assess the statistical significance of differences between groups.

Summary of Results for Each Tech Prep Claim

Hypothesis 1: Tech Prep students are more successful in secondary education than non-TPAD students as evidenced by their performance in core subjects.

The results of the statistical analysis was sufficiently robust to demonstrate the impact of TPAD and the connection between the project's intervention and its impact. Tech prep students demonstrated a significant change in scores on standardized measures. In the tenth grade, Tech Prep-selected students scored lower than the comparison group by a significant margin. Without the Tech Prep intervention, these students would be expected to remain behind the comparison group when comparing measures in the twelfth grade. However, given the Tech Prep intervention, these students surpassed the comparison group. This phenomenon is a direct result of the applied curriculum which is the foundation of the Tech Prep program.

Hypothesis 2: Tech Prep students participate in postsecondary education more frequently.

It is important to keep high school students in school and to graduate them; it is even more important to graduate them ready to enter and succeed in postsecondary education. For many years, project staff and high school faculty in participating high schools throughout Rhode Island have noted the very positive impact of the TPAD program on their students. With this evaluation, their professional judgments are now validated by empirical evidence of student performance gains.

This study is significant for two reasons. First, Rhode Island is one of a select few states to conduct a summative evaluation of its Tech Prep program. In order to remain one of the country's forerunners in tech prep, Rhode Island needs to be in a perpetual state of refinement to ensure that goals and objectives are successfully attained and to set new program aspirations in order to best prepare students to meet the ever changing needs of a global market place. Evaluation is key to bringing this concept to fruition. Second, this evaluation provides tangible documentation that Rhode Island's TPAD program does, indeed, positively impact participating students.

The following summarizes the significant findings of the evaluation:

- TPAD students attained significantly higher high school grade point averages than non-TPAD students;
- TPAD students' postsecondary participation rate was significantly greater than that for the non-TPAD students;
- Sixty-five percent of TPAD students reported that their grades improved while in high school.

The Program Effectiveness Panel approval of the Tech Prep Program Evaluation makes CCRI a member of the National Diffusion Network and eligible to apply for federal dissemination funds. The PEP Panel is an independent and rigorous panel whose members are evaluation specialists approved by the Assistant Secretary for Educational Research and Improvement of the U. S. Department of Education.

There were 225 students, 136 male, 98 female, registered for the Spring 1995 semester at the Community College of Rhode Island. Of these students, 60% are enrolled full-time, while 40% are enrolled on a part-time basis. Of the 225 enrolled students, 98 are freshmen who graduated from high school in June 1994. The following data were collected on these students during the 1994-95 academic year:

Semester:	**1994-Fall**	**1995-Spring**
Full-time:	175	124
Part-time:	54	101
Withdrew:	48	–
Total:	277	225

During the 1994-1995 year, there were 1,827 Tech Prep students at the secondary and postsecondary levels. Of the 229 students who were enrolled either full- or part-time during the Fall 1994 semester, 182 returned to enroll in classes for the Spring 1995 semester, resulting in an 81% retention rate between semesters. Of the 48 students who withdrew from classes during Fall 1994, 13 returned to enroll for Spring 1995. Twenty-four students registered for Spring 1995 were not registered in Fall 1994, but have registered for classes at CCRI in previous semesters. For six students, this is the first semester they have registered at the College. (See at the end of this chapter *Figure 1* and *Figure 2* detailing Tech Prep high school and CCRI enrollments from 1987 to 1993, 1988 to 1993 respectively.)

Tech Prep Associates Degree Program 1994-1995 Total Participating High Schools — Statistical Summary

In addition to collecting data for the evaluation, this study tracked the progress of students who have been involved with the program since its implementation in 1987. This information clearly demonstrates the success of the program in the following ways:

- Increased number of schools participating in the Program — The Rhode Island Tech Prep Associate Degree Program was implemented in 1987 when seven high schools agreed to offer Principles of Technology, the first applied academic course available. It is expected that approximately 78% of the public secondary schools in the state, or 37 out of a total of 47 schools, will offer Tech Prep courses during the 1994-95 school year.

- Increased number of students at the secondary and postsecondary levels of the program (see *Figure 1* & *Figure 2*, p. 126).

- Additional number of Tech Prep courses offered at the secondary level — As previously mentioned, the only Tech Prep course which was offered in Rhode Island in 1987 was Principles of Technology, an applied physics course. Today, the following Tech Prep courses are offered at participating high schools: Principles of Technology, Applied Communications, Mathematics for Technology, Applied Biology, Chemistry, Administrative Office Procedures, Introduction to College Business, College Accounting, and Applied Workplace Readiness.

- Expanded number of CCRI program areas which have articulation agreements with participating Tech Prep high schools.

Reference

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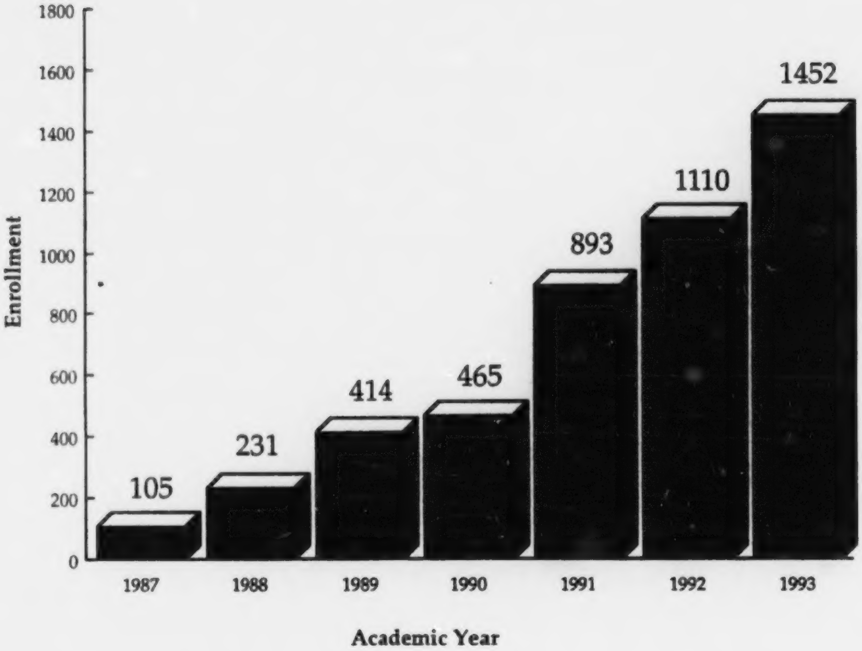

Figure 1. New Student Enrollment by Academic Year
Tech Prep High School Students, 1987-1993

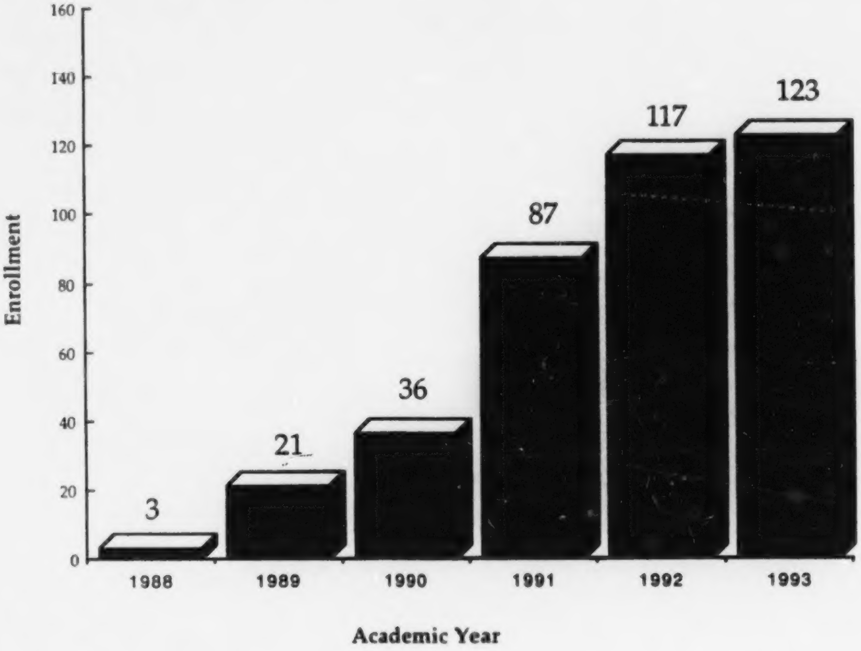

Figure 2. New Student Enrollment by Academic Year
Tech Prep CCRI Students: 1988-1993

Chapter 9

Music Plus: Creating An Academic and Musical Outreach Program for Urban School Students

by Victor Ellsworth

An Evolving Model

Music Plus, a musical and academic outreach program for economically disadvantaged junior and senior high students, has evolved over the past seven years. The goal of the project is to enhance the secondary education of its participants so that they can compete fairly in a university educational setting. While Music Plus uses the study of music as a "hook" to recruit its student participants, the curricular model can be adopted in a variety of disciplines. It would not be hard to envision Art Plus, Literature Plus, Math Plus, or Chemistry Plus as projects reaching into our communities to engage young minds and talents.

Based at Bowling Green State University, in Ohio, the project was originally conceived in the fall of 1987 and is based in part on its director's experiences in counseling university freshmen and sophomore minority music students who were experiencing academic difficulties in music classes and in danger of being dismissed from the university. Many of these students were intelligent, talented, hard working young people, but appeared to be confused by expectations within the College of Musical Arts environment. The frustration that each of them felt was evident during counseling sessions. In gathering information about their backgrounds, a composite picture began to emerge. The students were musically talented but had not achieved the same level of performance experience as had their non-minority peers when they entered the university. Consequently, when judged during the "jury" examinations held at the end of each semester, they were rated lower and seemed to experience a loss of self-esteem and confidence in the one area in which they had been encouraged to seek a university education - making music. Their backgrounds in comprehensive skills of music (theory, keyboard skills) were universally deficient to the point of being nonexistent, thus penalizing them even further. Other academic skills for which they had received grades such as freshman English, mathematics, and sciences, were not as clearly deficient, but were consistently lower relative to non-minority students. Finally, each of these students came from an economically disadvantaged background. An agency within the campus counsels and advises minority students, but their efforts could not appropriately assist with students' difficulties in the study of music.

While any conclusion about these students was based on a very small sample, something had to change. In many instances, individual faculty were working with individual students but never in a coordinated effort. The university's efforts included pre-emptive counseling, faculty advisors, and peer mentoring. However, these actions are reactive and do not address the root problem: the same expectations for all students based on different levels of preparation.

Consequently, active outreach, although vague in its conception, seemed very appealing — the university would go to the students to assist them in preparing for a college education, thus creating the potential for these students to compete fairly. Instead of casting a few lines to bring students to the university who might or might not survive the rigors of the first two years, the university and other committed institutions and agencies could work with potential students, both minority and non-minority, and with the schools, community, and parents to enhance the preparation of those young people who wanted a college education. The challenge was to develop an outreach program that would identify potential university students at an early enough time to be meaningful academically and keep them stimulated throughout the duration of their participation in this outreach program.

The Early Years of the Model

Phase One

The birth of Music Plus occurred in 1987. Initially the project was named the Toledo Project for no other reason than it was a project of the College of Musical Arts and the first students came from Toledo. It would be gratifying to claim that the project was an instant success, that the curriculum as it exists today was the curriculum we started with in 1987, that the original 13 junior high students recruited for the project are nearing the completion of their high school schooling, and that all are preparing to enter the university of their choice. But none of this is true. The only remaining components left from the first phase, and the ultimate failure of the initial project, are the curricular concept and the two co-directors, myself and Professor Anna Belle Bognar.

The directors learned by doing. The curricular concept was based on the premise that the students in the program would grow academically by working in several tracks of intellectual and skill development. The directors constructed a course of study based on the students being in the project from the seventh grade through graduation from high school, meeting for two-and-one-half hours once a week during the academic year and for a one-week resident camp during the summer. The students would be exposed to skill development, private music lessons, comprehensive musicianship experiences gained through the use of keyboard skills, and a small group session where the students would be challenged to think out loud about a variety of topics, both musical and nonmusical, without fear of failure.

The university president provided a small grant to pay for transportation. Thirteen string instrumental students in the seventh and eighth grades were signed on. A university van arrived each week at the students' homes to pick them up and take them to the university, 20 miles away in a rural setting. Each of the students had a musical instrument lesson taught by a university string student, and each was in a keyboard class emphasizing comprehensive musicianship skills. The 13 students were divided into two conversational "think-tank" groups directed by a reading specialist with a background in music who was expert in working with inner-city youth. Each came to a summer music camp to play in a string orchestra, all as promised. This model, which began in January of 1988, worked for the first year and a half. In the beginning of the 1988-89 academic year the project began to deteriorate. Students began to miss the Wednesday night sessions, and the public school instructor did not agree with the concept of working with the students beyond just teaching private lessons. Without the public school teacher's support, it became difficult for the students to gain access to their instruments on the Wednesday evening meetings. Attendance became even more sporadic. The directors decided to cancel the project for the Fall 1989 term, redesign the curriculum and try again during the 1990 Winter session. Only a few students continued, and the program was abandoned.

Phase Two

Unwilling to admit defeat, the directors made a commitment to redesign elements of the project during the 1990-91 academic year without changing the basic curricular concept. The Toledo Public schools, through their Art and Music Coordinator, were approached with a new plan. The first new guideline was that the school and college would operate in partnership in the selection of the new students who were to be recruited at the end of sixth grade. While seeming to be hard-hearted, the directors had learned that the program could ultimately serve only 28 students per year — the number of spaces in two vans that would be used for transportation. The new students would have to be reliable in attendance and have home support.

The program's second guideline included identifying students who had demonstrated some type of academic ability either in the form of testing well on standardized tests in the Toledo Public Schools Horizon Program for gifted students, or a teacher recommendation, usually the general music teacher. Additionally, the general music teacher was asked if the potential students had some musical interest in either vocal or instrumental music. A final pool was developed, relying heavily on the classroom general music teachers' recommendation. The students were then interviewed at school, and a note was sent home inviting the students to participate in a summer, week-long day camp on the Bowling Green State Campus (returning students participated in the same camp but as resident campers). Perhaps the most critical element in recruiting the students was that the program director went to each student's home and met with the family to describe the program and its goals, strongly stressing the primary responsibility of the students — regular attendance. This simple act of involving the families of the students from the beginning by personalizing the program may be the single most important contributor to the project's success.

Using these two guidelines stabilized attendance for the students in Phase Two. Of the 11 seventh graders recruited during the 1991-92 academic year, eight are still in the program after three years. Ten of the second year's 12 recruits are in the program after two years and all of the six new students from 1993-94 are still attending.

Music Plus

The Model

In developing the Music Plus outreach model, two distinct segments were defined. The first was the curricular paradigm, and the second was the development of the resources necessary to operate the project.

Curricular Paradigm

The current format of the project includes Wednesday night meetings during the Bowling Green State University academic year. Two vans pick up students at their homes and drive them to campus. Wednesday night includes experiences in three modules. Each module is 40 minutes long with a five-minute break between each session.

Module One: Private lessons for half the students and Imagine Module (explained below) for the other half.

Module Two: Private lessons for half the students and keyboard class for the other half.

Module Three: Keyboard class for half and Imagine for half.

The concept of the Imagine Module is a key element in the academic enhancement process. The Imagine Module provides an eclectic overview of an introduction to arts through student creative projects and experiences. A third team consisting of Dr. Joyce Gromko and Diana Rao, a doctoral theater student, works with the Music Plus students in this facet of the project. Some of the activities have included: writing for, acting in, and composing music for a "soap opera" episode based on life at Jones Junior High; composing an opera, using songs and records from other sources, about gangs in the inner-city; interpretation of poetry by Maya Angelou, Langston Hughes and others through visualization and interpretative readings; learning to play the blues; exposure to world music as well as other activities. Faculty from other disciplines such as art and English have made guest appearances. A part of each Imagine session is for the students to react to what they have seen or are doing. Students also keep logs during the week. Dr. Gromko reads the logs and responds with encouraging reactions to the students' thoughts. The activities in the Imagine module are process-oriented and not meant for final performances. This module is staffed with university students who lead small group discussions or assist the Toledo students with preparation for poetry readings.

Private lessons are taught by university undergraduate and graduate music student "volunteers" who may enroll for one credit of teaching practicum credit. Through the use of grants provided by individual donors and Toledo-based businesses and agencies, students are each provided with their own instruments, materials, and whatever equipment is necessary. Three of the students have elected to study piano — two have electric keyboards at home and the third has a piano, all of which have been provided by the project. Other instruments being studied include bassoon, oboe, violin, viola, cello, clarinet, flute, trumpet, trombone, and voice. The teacher marks lesson progress in a notebook that is maintained for each student so that substitute lesson teachers will know the status of their students. Duplicate materials are also kept in a file cabinet in case the students forget to bring their music. Two recitals are held each year, one at the conclusion of the fall semester and the other at the end of the spring semester, but students are under no pressure to perform. Parents and family are invited to the spring recital.

The keyboard class is under the direction of Anna Belle Bognar, co-director of Music Plus and a recognized leader in the venue. Students are placed into small groups of three to four with one university teacher volunteer per group. Two keyboard classrooms are used with Professor Bognar circulating among groups. Professor Bognar has designed a special curriculum in which students achieve levels of proficiency and then move on. Pacing is individualized, and groups are constantly rearranged to accommodate the different learning levels. The curriculum is oriented around a theoretical knowledge and aural skills base rather than keyboard skill facility. A concealed intention of the keyboard module is the development of critical thinking and analytical skills.

The Music Plus students are notified of special university events or concerts to which their admission is paid and transportation provided. The conclusion of the year features families coming to the College of Musical Arts to "shadow" their child through a modified version of a regular evening, a short recital, and a party. Approximately 80 family members attended this session in April of 1993.

As the concept of Music Plus and its implementation have grown since 1987, the project's initial focus of enhancement in the preparation for only music studies has grown to include the creation of opportunities for the students to seek a university education in their academic choice. The 1994 summer camp for the returning 24 students included learning to use computers to access the Internet and the World Wide Web, the production of a play, attending concerts, and working with technology in music production and performance. In the Fall 1994 semester, returning students were to have been paired with university students in disciplines other than music which would reflect their current academic and career interests. This plan was deferred until the Music Plus students enter the eleventh grade in the Fall 1995 semester. This was done in order to assist them with beginning to plan for admission to universities of their choice.

The 1994-1995 academic year and summer proved to be equally exciting for the project. The total number of students grew to 29. The academic year passed with all the returning students attending on a regular basis and the five new students not missing any sessions. Regrettably, two students chose to leave the program, and two sisters in the program moved to Detroit.

As the students continue to make progress in their musical lessons, a new maturity and performance level has begun to emerge. The primary focus of the Imagine module during the 1994-1995 academic year was for each of the students to develop a chronicle of their family. This was accomplished by providing each with a hand-held tape recorder which the students then used to record family members' histories. These "chronicles" have since been transcribed from tape and published for the students and their families. A university theater faculty member has become intrigued with the idea of turning these family chronicles into a play and will work with the students during the 1995-1996 academic year.

The 1995 summer camp was the most challenging and rewarding experience to date. Twenty of the students attended the week-long event, and four of the Music Plus university student teachers served as counselors with an additional Music Plus university student teacher serving as a photographic consultant. The students were divided into four groups and spent the week taking photographs based on their interpretation of images. At the concluding camp session each group presented their photo essay accompanied by poetry they had written as well as musical selections chosen to reflect their feelings.

Resources

Resources come in many forms. The primary ingredients are the students and their families. Without their desire and commitment, there could be no program. However, other human, financial, and physical resources are waiting to be tapped. Individuals ranging from university students to university administrators have given their time in teaching and promoting the project. Individuals, businesses, and foundations in Toledo have provided financial support to create the program's unique ability to provide quality musical instruments, funds for travel, opportunity to attend concerts and special events. Depending on the scope of the project, institutions are willing to open their doors in the cause of providing educational opportunities to assist these worthy students.

The Future

The role of an outreach program such as Music Plus or similar projects must become integrated with the needs of a multi-class society with "have and have-not" communities. The university with all of its assets can afford to extend its walls to bring to a deserving community the resources and encouragement that will lead to an educated citizenry.

What have we learned in Music Plus that we can share in developing similar outreach programs?

1. The program must be founded on the principle that any help at all is better than no help, and that the orientation must be academic enhancing but not a substitute for academic development.
2. Everyone profits. An unexpected benefit of the Music Plus project has been the raised awareness of the university students regarding young people from the inner-city, the pride of the parents, and the involvement of many individuals, businesses, and agencies outside the university — a true partnership.
3. Think big but start small. One person working with three students is a beginning and can make a difference.
4. Never take no for an answer — just try a different approach.
5. You will never know if someone can and will help unless you ask.

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Chapter 10

The Worcester Polytechnic Institute School-College Collaborative: Engaging Women and Minorities in Mathematics and Science

by Lance Schachterle

Identifying Needs that Result in Collaboration

Worcester, Massachusetts, is the second largest city in New England with 22,400 students in public schools, 42% of whom are minorities. Because of an open enrollment policy, students at all levels can attend either their neighborhood school or any other school in the city as long as they do not impact negatively on the city-wide de-isolation plan. Through a series of successful magnet and specialized schools, Worcester has avoided the worst problems of many inner cities.

Yet like all cities in Massachusetts, Worcester's investment in public education in the last decade has been severely hampered by a referendum limiting the amount school boards can draw from a property tax-based civic funding system. Given such tax initiative realities, the Worcester Public Schools (WPS) look with special interest to marshaling the talents and contributions of the ten colleges and universities in the immediate area. In addition, Worcester can draw upon a well-established consortium for higher education, one of whose many offices provides direct support to school-college and school-business collaboration in the city.

Like other technological universities, Worcester Polytechnic Institute (WPI) has long been concerned about the preparation of students for advanced study of mathematics, science, and engineering. Given factors such as the shrinking demographic distribution of students of college-bound age, the dramatic changes in career opportunities in engineering, and the increasing recognition of a responsibility to encourage and support the pursuit of science and engineering studies by underrepresented groups, institutions like WPI are actively working at the precollege level to prepare minorities and women for mathematics, science, and technology-based studies. At the same time, WPI has begun working with precollege mathematics and science educators who are seriously wrestling with issues of motivating and supporting a diverse student body with differing learning styles. These collaborations have much to teach college faculty about pedagogical techniques and skills.

However, until recently WPI, like most other technological universities, lacked the means to make a significant and sustained difference in precollege mathematics and science studies since universities of science and technology rarely have departments like education or social services where students and faculty have a disciplinary interest in precollege learning and teaching. WPI's capacity to contribute to precollege education fortunately was much enlarged through a major recasting of the WPI academic program in the early 1970s, which provided unique opportunities and motivation for a technologically-oriented community to interact with precollege educators.

The Interactive Qualifying Project (IQP): A Linchpin for School-College Collaboration

To ensure that all WPI graduates begin to grasp the complex interrelationships among science, technology, and society, the WPI faculty 25 years ago designed a new academic program including a required nine-credit hour project, the Interactive Qualifying Project or IQP. In the IQP, the students, who often work in teams on issues provided by off-campus sponsors, are asked to apply the kinds of problem-solving techniques they learn in their WPI education to complex societal issues.

Since the inception of the new program in 1972, the single most popular area of study for the IQP, among both faculty and students, has been "Technology and Education." Because of pedagogically-oriented IQPs, annually over 100 science and engineering students have gone into local and regional schools to carry out experiments in improving mathematics, science, and computer science education. Such projects typically involve identifying a promising new way of teaching a specific classroom population, and with the close support of the classroom teacher, designing an implementation scheme to test the new way of teaching. The results, ideally, involve recommendations to the collaborating teacher for the continuation, modification, or, on occasion, abandonment of the initial hypothesis about improving teaching.

The model IQP for the classroom yields a new teaching strategy that can be tested, evaluated, and modified; and the classroom teacher helps to develop new ideas and often some useful modules or experiments to continue using. The school pupils experience new learning techniques and often see the WPI students as role models. Finally, the college students learn something about mathematics and science education in an urban, multi-cultured environment. This experience can be most helpful for their professional careers and perhaps will guide them in their volunteer activities when they graduate. Although in the early stages of development, one of the most promising initiatives is the potential long-term relationships between college and precollege mathematics and science faculty who recognize similar pedagogical issues and begin to plan projects to explore such relationships in depth. (This kind of partnering is discussed in Greenberg, 1991.)

An IQP called "Stimulating Educational Desire in High School Students," completed in Spring 1995, may illustrate how the program works. The principal of nearby Doherty High School requested that a WPI team examine how to prepare students better for introductory algebra — a tough teaching challenge that is increasingly more difficult with the reduction of separate tracks and significant increases in classroom diversity. Five WPI students from diverse high school academic backgrounds tackled the problem between October 1994 and May 1995. They examined previous literature on the topic, including a previous IQP aptly titled, "Turned Off or Never Turned On?" and then began working closely with two Doherty High faculty. The WPI team solved the problem by providing intensive small group tutoring to the classes. In contrast to the effects of conventional lecture-style teaching, the success of the small group tutorial was apparent. The multiracial composition of the WPI team was invaluable in working with a diverse urban high school population. After negotiating many trials and challenges in terms of gaining respect in the classroom and introducing team-based and peer-assisted learning, the team had the satisfaction of observing that the high school teachers had begun using the teaching techniques they had developed as part of their regular teaching repertoire. The WPI students left Doherty High with a sense of accomplishment well documented in a written report and an accompanying video including students' comments.

The IQP activity is part of a campus-wide degree requirement, so base funding is not necessary; indeed, each student is asked to contribute up to $50 a project (in lieu of book purchases). This contribution helps to defray modest costs of materials and local travel. WPI has received significant funding for targeted programs through Eisenhower grants from the Massachusetts Department of Education. In addition, as noted in the next section, the minority outreach components of this program have been funded by a number of state and private sources.

To consolidate the community effort supporting these teaching projects in 1986, WPI organized a separate program, the WPI School-College Collaborative for Mathematics and Science Education. From 1989 to 1994, the Collaborative was led by retired Worcester Public School Principal, Frank Trainor, whose breadth of contacts within the public schools ensured unusually strong contacts and communications with classroom teachers and principals. Through the Collaborative, WPI has conducted biennial reviews of educational project activity as part of a faculty peer review of all IQPs. These reviews have been carried out by three faculty with diverse backgrounds closely associated with the program: Frank Trainor; Thomas Keil, Professor of Physics; and Mayer Humi, Professor of Mathematical Sciences. Results of these peer reviews are communicated to the faculty advisors of IQPs to assist in their professional development. Faculty who consistently advise projects of high quality are commended by a review process that includes input into the annual merit raise determination.

Access and Retention Issues

WPI's close collaboration with public schools in Worcester has provided abundant opportunities to work with minority populations underrepresented in science and mathematics education. Three programs — Project COMET, the Massachusetts Academy for Mathematics and Science Algebridge program, and WPI's Strive for College — emerged in part as significant consequences of WPI's IQP-based school college collaboration.

Project COMET

In the late 1980s, because of WPI's experience in outreach in mathematics and science education through IQPs, the institution received support from the Commonwealth of Massachusetts for outreach to pupils traditionally underrepresented in such careers, including women and students of color. Support subsequently came from the Xerox Corporation, GTE, and the Nellie Mae Fund for Education. Project COMET, (Combining Math Enrichment and Technology), launched in 1986, is a program designed and coordinated by the WPI School-College Collaboration director. COMET demonstrates to pupils and their parents that careers in science and technology are possible for students who work up to their potential. With the assistance of guidance counselors, WPI invites students of color to participate in after-school programs with experienced faculty. These faculty are supported by WPI's IQP or volunteer students, who are trained in workshops to provide them with the counseling and teaching skills they will need. Equally important are outreach activities to the families of students, including home visits to discuss not only the possibilities of achieving a college education, but also to review general procedures and timetables for testing, filing admissions applications, and applying for financial aid.

COMET's initial population was high school juniors, but program evaluations soon pointed to the need to intervene earlier in students' careers. Consequently, in the last three years the program has worked mainly with middle school students. For example, in 1993-94, 22 students participated in 26 weekly 90-minute sessions, and 11 women students participated in 1993-94, a considerable increase in women students over previous years. The mathematics and science teachers, selected from the Worcester Public Schools, use a team-teaching approach, as well as peer tutor assistance from minority senior high students and WPI students (minority and majority). An outreach counselor works closely with parents and students, maintaining a profile on each student with grades recorded and progress reviewed with the classroom teacher.

In 1993-94, the director assessed the results of COMET in terms of student interest, finding that virtually all participants hoped to go to college. Follow-up on these stated intentions is difficult to monitor when the students graduate. However, of the roughly fifty students who participated from 1989 to 1991, information on students who matriculated at local colleges indicated that two students each attended WPI and the College of the Holy Cross, and one each attended Worcester State and Quinsigamond Community College. In addition to the after-school sessions, students in the program are invited to WPI's open house campus tours and a range of events at WPI and other institutions. The students also benefit from additional enrichment programs through a separate grant to WPI for global education workshops.

Algebridge and the Massachusetts Academy of Mathematics and Science

In Winter 1991, several state legislators approached the president of WPI with a fairly radical proposal: to found a publicly-funded high school for high achieving high school students in mathematics and science on the campus of a private technological university. Given WPI's 20-year history with the IQP and five years of experience with the School-College Collaborative, the challenge seemed a logical extension of the Institute's experience with precollege education. After discussions with faculty governance, WPI agreed to found the Massachusetts Academy of Mathematics and Sciences. The new school opened in the fall of 1992.

From the inception of the Academy, the Massachusetts legislature shared with WPI a crucial concern that the Academy reach out to student populations underrepresented in science and mathematics higher education, especially people of color, students from lower income groups, and the biggest minority of all in these disciplines — women students who too often get "turned off" about mathematics and science by middle school. Indeed, in funding the Academy from the state budget, the legislature specified as a primary goal that the Academy strive for equal gender representation and focus considerable attention on outreach to students of color.

Recruiting students from high schools in Worcester and the surrounding area to the initial Academy senior year in 1992-93 resulted in a shock to the planning committee: no students of color applied from Worcester because not one student of color had been "tracked" into algebra and other subjects leading to the admissions criteria for the Academy (which resembled WPI's criteria for entering students). After reviewing this dilemma, the director of the Academy, Leah Vetter, with the full support of both the Academy faculty and WPI's administration, proposed to institute at the Academy in Summer 1993 a new approach to introducing eighth grade pupils to algebra called Algebridge. Developed by the Educational Testing Service (ETS), Algebridge uses many innovative pedagogies, such as active learning, team problem-solving, and visual, oral and written communication of mathematical concepts to help students use arithmetic creatively in the transition to algebra.

With support from local industry and banks, Ms. Vetter raised nearly $50,000 to offer Algebridge to 68 rising eighth grade students, 34 minority and 34 majority, none of whom had been identified as eligible for eighth-grade algebra. The program, jointly taught by five Worcester public school and two Academy faculty, offered three hours daily instruction over six weeks in the summer. Of the 68 students who entered, 58 persisted through to the end. A significant reward for their perseverance was the promise made by Worcester Public School administrators that those students finishing the course would be given seats in algebra in the fall at their home schools. (Equally important, the five Worcester public middle school faculty returned in the fall to their middle schools prepared to share with their colleagues the new pedagogical techniques they had acquired.) Reports from teachers who worked with these students in the 1993-1994 academic year indicated they consistently performed above expectation, and many teachers who had Algebridge students commented on their superior team work and willingness to participate in class and their ability to grasp content.

The successful effort of 1993 stimulated a more ambitious, system-wide effort for summer 1994 which involved 85 rising eighth-grade students and one faculty member from each middle and high school (a total of 15 Worcester Public School faculty). The goal is to enable teachers to return to their regular school in the fall, prepared to integrate Algebridge into the curriculum (which is being significantly revised to move away from traditional ability tracking). In addition, the students from both summers will be asked to assist in this city-wide reform, with the support of WPI's IQP teams. The goal is, in fact, to make Algebridge the standard for the Worcester public school mathematics program. The success of these summer programs will, thus, be marked by their termination, with the mission accomplished. Algebridge will play a significant role in effecting a state mandate to replace traditional ability tracking with class structures that provide all students with consistently high expectations for performance.

Strive for College and Careers in Mathematics, Engineering, and Science

Having observed the success of COMET and especially Algebridge, in summer of 1992, WPI undertook Strive, a major new initiative in minority outreach to the precollege community with the first offering of an intensive, nationwide summer mathematics and science program. With the support of the United Technologies Corporation, Strive invited minority high school juniors from around the U. S. to spend four weeks at the Institute — two weeks in a general science classroom program called Frontiers and two weeks working under faculty supervision in a lab. In the first year of operation, some thirty students from New England, Puerto Rico, and the Midwest participated. Students who follow up their success by maintaining their studies at a high level and by keeping in contact with WPI through their senior year have a high probability of being admitted to WPI with full financial aid.

The Strive Program targets rising seniors from underrepresented minority groups, i.e., students of African, Hispanic, and Native-American descent, for participation in a summer academic enrichment experience intended to:

- encourage students' interest in mathematics, engineering, and science;
- introduce students to the college experience and research;
- support student efforts to earn a college degree.

United Technologies Corporation has provided funding which enables approximately 30 academically talented students from across the country and Puerto Rico to spend four weeks at WPI, two weeks in one of seven academic disciplines, and two weeks in an research/laboratory internship either in the research laboratory of a WPI faculty member or in an off-campus site such as Norton Company and the New England Science Center. Students who complete the Strive program and who meet the Institute's admissions requirements are offered attractive financial aid packages. Matriculants are offered academic and nonacademic support to assist in their success in what continues to be predominantly a White male institution.

During their senior year, the Strive participants receive WPI-specific information from the Admissions and Minority Student Affairs offices, but they also receive generic information about engineering and science careers and opportunities from the Office of Multicultural Affairs. WPI's major minority recruitment and retention efforts are orchestrated by the Office of Minority Student Affairs, a relatively new campus office created in recognition that motivation and strong academics are not the only elements necessary for students of color to succeed.

Strive's success is measured not only by the evaluations completed by participants, instructors and staff, but also by tracking the post high school progress of Strive students. The goal is not to have Strive students matriculate at WPI, and, therefore, this is not used as a measure of success. Although it is desirable to conduct an annual follow-up over a five-year period, due to limited resources, only a one-time, twelve-month follow-up is conducted regularly. Of the 1992 class of Strive participants, the first group to complete the program, 10 of 20 applicants were admitted. Seven of this group enrolled at WPI. Nineteen of the 30 participants in 1992 completed a follow-up survey revealing that all had enrolled at a college. Eighteen students were majoring in engineering or science and one in business and finance. Three-fourths of the 60 students from the 1992-1993 summer program are in college; of the 46 students who enrolled in college, 41 are majoring in science or engineering, the remaining five students are majoring in architecture, education, finance, law, and one has not yet declared a major. (No statistics are yet available on the students enrolled in the program in 1994.)

Future Directions

WPI is fortunate that during the last 15 years the entering class size has remained at essentially the levels anticipated by administrative and financial planning. Many faculty recognize that this enrollment stability is, in part, because of outreach efforts to communities traditionally underrepresented in WPI's mathematically-focused education. Many faculty also are starting to realize that the typical matriculant of past decades — a White male from a small New England community with a strong interest in engineering — is giving way to a much more diverse incoming student population, with diverse talents, abilities, perspectives, and needs.

Working as a community in the School-College Collaborative has helped sensitize WPI to the changes taking place around the campus and the increasing need for WPI to change in order to succeed in attracting and retaining underrepresented students. For example, John Wilkes, a faculty member in the Department of Social Science and Policy Studies, has been conducting collaborative IQPs for many years on the match between various performance indices and screening exams such as SATs, and the success measured of mathematics and science students at WPI and after graduation. His work suggests that students who do not rank as highly on conventional indices — including many students of color — have excellent potential for careers in science because they often intuitively grasp connections over considerable intellectual distances. They are "Remote Associators" — students with a learning style that helps them to make mental connections between ideas that escape other, more conventional thinkers. Learning how to assist remote associating students at both the precollege and college levels is an exciting challenge to undertake, in which both precollege and college faculty have much to offer each other.

Another pressing goal for the WPI School-College Collaborative is enhancing the continuity of existing programs. Presently, IQPs are conducted at all school levels, kindergarten through twelfth grade, throughout the city of Worcester and beyond. Worcester has four high schools, one roughly in each geographic quadrant of the city, each linked to a single junior high and anywhere from ten to twelve elementary schools. To date, IQP efforts have been diffused throughout the city with respect to quadrants and levels. Consequently, for example, no evaluations exist on the fourth grade "hands-on" science program relative to retention in mathematics and sciences for students of color in middle school or high school. Concentrating these projects on the quadrant of the city in which WPI is located will provide previously unobtainable data on the impact of collaborative programs from grade to grade.

The current goal is to forge a close alliance with the Doherty Memorial High School, just a few blocks from the WPI campus, by establishing a formal project center that can pursue both internal and external funding. This project center will have at its core a planning group of college and precollege faculty who view WPI, Doherty and its feeder schools, and the Massachusetts Academy of Mathematics and Science (at WPI) as a common campus with a continuum of similar pedagogical issues. Such an academic alliance of faculties will succeed only if the participants acknowledge that they have much to learn from each other, and that their professional development will be enhanced through collaboration.

Progress towards such a goal began at joint school-college meeting held at WPI during May 1994. During the meeting, three workshops focused on shared needs in the areas of curricular planning, professional development, and strategizing for team-based project-oriented education. Forty participants came in equal numbers from WPI and the Massachusetts Academy and schools of the Doherty quadrant. The theme of the conference was learning from each other — recognizing that collaborations must be based on identifying what every party has to offer and to learn. This workshop marks the next step in formally establishing a professional development collaboration in mathematics and science education stretching from grade school to graduate school.

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Chapter 11

Academic Support Systems: Mentoring Underrepresented Students of Color

by JoAnn Moody

"If I had listened to my high school guidance counselor, I'd have gotten a cosmetology certificate and would be operating Angie's Beauty Salon right now" — Native American student at Harvard University.

"It's lonely being the first and only minority in my doctoral department. I really feel out of the loop and out of touch" — Boston graduate student.

"Go to college? Are you kidding? I don't have straight A's so that means no scholarship money for me. I know I've missed the boat " — Vermont high school student.

These remarks sketch in brief the psychological barriers and confusions faced by many students of color who are studying at predominantly White high schools, colleges, and graduate universities in the six-state region of New England. Their disadvantages can be summarized thusly:

1. Cultural Isolation — Feeling like an academic outsider and pioneer who must cope with these demanding roles; having no older mentors or exemplars with a similar cultural background to look up to who demonstrate that success in the dominant Caucasian system is desirable, possible, and indeed not that exceptional (Blackwell, 1987; Loo & Rollison, 1986).
2. Lack of Information — Being untutored in how to negotiate the Byzantine intricacies of academia and how to get one's fair share of the financial aid provided for undergraduate and graduate studies. Lack of sophistication coupled with bewilderment often leads first-generation college students to screen themselves out of the educational pipeline at various transition points (London, 1992; Zwerling, 1992; Braddock, 1992).
3. No Encouragement nor Active Discouragement — Being ignored or, even worse, hearing stereotypical remarks or sensing belittling attitudes from authority figures. Such behavior can make students doubt their innate capacity to master difficult intellectual concepts or realize ambitious professional goals (Moses, 1989; National Institute of Independent Colleges and Universities, 1991).

The Collaborative Solution

To begin to shrink these disadvantages, the New England Board of Higher Education (NEBHE) in 1990 resolved to build interstate academic support networks for students of color from various educational levels — high school, community college, undergraduate, graduate, and post-doctoral — and from the mostly rural states of Vermont, New Hampshire, and Maine and the mostly urban states of Massachusetts, Rhode Island, and Connecticut. In these support networks the students could befriend, inspire, and learn from one another as well as have easy access to dozens of warmly encouraging role models and mentors of color — people who are surviving and succeeding in predominantly White settings, in particular colleges and universities and for-profit and not-for-profit corporations.

Before organizing the networks, NEBHE sought the counsel and assistance of various minority and majority leaders and large and small groups, which will be named later in this chapter. Because NEBHE is by its nature a coordinating organization, charged to work with the six New England states and their public and private colleges and universities in order to expand educational opportunities and services, the organization enjoys a wide range of working relationships with other educational, governmental, and business associations and leaders and is accustomed to collaborative problem-solving. Since its founding in 1955, NEBHE has been known as a convener and broker.

The concept of the support networks was shaped by several distinguished scholars and practitioners whose writings were consulted and who generously shared insights and caveats in personal conversations and consultations. Two professors in the Boston area, James Blackwell (1983, 1987) at the University of Massachusetts-Boston and Charles Willie (1981; Willie, Grady, & Hope, 1991) at Harvard University, have underscored for more than a decade how critically important it is for minority graduate students to network and build community with one another and with older, successful role models and mentors of color. Their guidance in forming the New England support networks was invaluable. Professor Uri Treisman (1992), formerly at University of California – Berkeley and now at University of Texas – Austin, has demonstrated the effectiveness of study groups and peer teaching in helping to meet the psychological, social, and intellectual needs of underrepresented students. At Berkeley, Treisman discovered that his Asian-American calculus students formed "study gangs" with one another in order to succeed but his African-American students trudged off to the library alone and did poorly because they were not benefiting from peer instruction and support. Treisman's insistence on intellectually strenuous collaborative learning led by a carefully trained instructor continues to pay dividends in fields other than mathematics not only for minority but also majority students (Wheeler, 1992).

Mutual aid societies and peer support are hardly new. In academia, for instance, the American Indian Science and Engineering Society is a model that this author studied firsthand as NEBHE vice president. Annual Society meetings produce a sense of excitement about academic communities. Hundreds of Native-American high school and college students and role models come together to discuss strategies, to confide in one another, and to celebrate their academic survival and success. As a second example, the frequent meetings of African-American doctoral students supported by the Florida Education Fund allow for unforgettable "testimony" from students and role models on how to negotiate the demands of academe by "bobbing and weaving without losing your integrity," as described by Fatimah Jackson, Professor of Biological Anthropology at the University of Maryland-College Park.

The New England Model

Given these successful models and the guidance of diverse advisors, NEBHE determined that the support networks should contain the following six elements.

1. A Critical Mass of Students — Because exhilaration is produced when students of color, routinely outnumbered in predominantly White academic settings, are brought together to form the majority for a change, each of our region-wide network meetings has always contained at least 300 students and has been hosted by the Massachusetts Institute of Technology and the President's or Provost's Office. Usually 100-150 students take part in each of the statewide network assemblies hosted by one or more campuses or businesses in each New England state, such as the University of

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New Hampshire, St. Michael's College in Vermont, Southern Connecticut State University, Mt. Holyoke College in Massachusetts, or Boston College. Since the first meeting in October 1990, a total of 5,000 students have been accommodated at various NEBHE network conferences. In the fall of 1994, NEBHE's Science and Engineering Academic Support Network was expanded to receive 400 students at a time.

2. A Role-Model Chain — To help students visualize themselves further along in the educational "pipeline," the network meetings bring in high school, community college, undergraduate, graduate, and post-doctoral students. When these students speak candidly of the challenges, problems, and successes they are having and the future educational steps they are preparing to take, they have a group of avid listeners who are often thinking to themselves, "Gee, if she can do that, then I can." NEBHE advisors were absolutely correct in insisting that slightly older or more advanced students have an incredible influence over those two or three years behind them. The network meetings provide ample opportunities, on the formal agenda and in the informal receptions, for students to give peer advice to one another and use their lives as examples.

3. A Critical Mass of Role Models and Mentors — It is not sufficient to have merely a handful of impressive speakers during the network meetings. The practice is to have usually one role model or mentor for every three students and to have close interaction among the elders and the students at small group discussions, at lunch, and at the afternoon reception. This critical mass of successful leaders of color — usually 100 at the regional meetings — makes a powerful statement to the students. In addition, the leaders enjoy being part of the larger group, sharing camaraderie with one another, and confiding in one another about how they are surviving and succeeding in their predominantly White workplaces. About 80% of the leaders are college faculty and 20% are corporate and governmental employees.

4. Include All Four Ethno-Racial Groups Underrepresented in New England Higher Education — Advisors thought it important to reach out simultaneously to all four minority groups that are underrepresented (proportional to their share of the region's population) in both enrollment and degrees earned at the region's colleges and universities, namely Native Americans, African Americans, Latinos, and Southeast Asians. While there might be some cultural clashes, it seemed essential to risk these and hope that the differences between the groups would finally not obscure the common problems and strengths possessed by the four. That has turned out to be the case.

5. Each Day-Long Meeting Should Offer Personal Testimony, Inspiration, and Information — Above all the network meetings promote personal testimony from the role models and the students about the barriers they are facing or have faced and how to overcome these barriers. Such truth-telling is sobering in its effect but simultaneously inspirational for listeners. And it is essential that the students be able to speak in addition to the older mentors or outside speakers brought in for the day. Also mandatory are "nuts and bolts" informational workshops on how to be accepted to a college or graduate school and secure financial aid, and how to survive once enrolled, with emphasis on why and how to form study and support groups with one's peers.

6. Practice Networking — Through early morning warm-up sessions, students come to understand how networking can open doors of opportunity. Through practice throughout the day, with business cards and the directory of network members in hand, the students become

bolder about introducing themselves to more advanced students and role models and making the network contacts that will later lead, usually, to phone calls, new friendships, and summer internship experiences with faculty or business mentors. Having participated in their own warm-up sessions, the role models and mentors realize that many minority students do not feel entitled to the attention of adult sponsors and will need cordial prodding and coaching if they are to build their own support systems. The role models often disclose to the students that they themselves are still adding to their own support systems and that "you never outgrow your need for more mentors or network contacts."

Evaluation

There is abundant evidence that the one-day meetings of the various support networks are extremely successful. The psychological exhilaration generated by the day seems to be long-lasting, and the information exchanges proved immediately useful to the students as well as the role models and mentors. The organizations and leaders helping to organize the meetings are well pleased; 90% or more of the students, role models, and mentors typically give the network meetings an "excellent" rating on the written evaluation forms. In fact all the networks, in particular the region-wide Science and Engineering Support Network, must be immediately expanded to accommodate a far greater number of students. Schools, college campuses, and enrichment programs now lobby strenuously for the right to send "*all* my minority students — this is a once-in-a-lifetime experience that all of them should have." Most gratifying are the personal remarks that are penned on the evaluation forms of the network meetings or on Christmas or New Year's cards received by NEBHE staff, such as:

"I've never been in a room with so many folks getting their doctorates. I didn't know they existed. Man, I'm proud of my people" — High School Student.

"I like the way the undergraduate and the graduate students made the high school students feel comfortable and welcome. I really felt as though they were willing to help us and they made us feel that we could achieve whatever we set our minds to. I loved it" — High School Student.

"I always heard of Blacks and Hispanics attending Harvard and MIT and having PhDs, but I never really believed it. However I actually met these people today! Nothing is impossible" —Community College Student.

"I now feel comfortable speaking to others regardless of their level of achievement" — High School Student.

"Up until this time I really felt overwhelmed and bewildered about what I'd gotten myself into in grad. school but now I have new friends, new coaches, and new strength" — Graduate Student.

"I enjoyed being able to gripe, and not only get back sympathetic responses but also share experiences. It was wonderful to not feel alone. I have never attended anything like this! It gave me a chance to share my sadness and triumphs. It made me appreciate both how strong and how weak I am" — Medical Student.

"It was great to meet and connect with other Native Americans — it has saved by sanity. I had thought about dropping out of college but now I'll hang in there" — Undergraduate Student.

"I will definitely return to campus with a more positive spirit and will become more active in trying to provide minority students of the future with an easier road to follow" — Undergraduate Student.

"I learned that professors and students have had the same experiences as me and that I'm not the only one going through this" — Post-doctoral Student.

From the Network role models and mentors came equally crucial observations:

"This experience has energized me and I am more determined to make myself available to mentor minority students" — Faculty Member.

"I so enjoyed the solidarity, spirit, and being able to share my knowledge and experience with young people actively engaged in the struggle to succeed. This has meant a lot to me" — Business Leader.

"I don't mind telling you that I'm a tenured faculty member but I have never before been in a room filled to the brim with minority professionals and ambitious students. Usually at scientific conferences I'm the lone minority woman" — Botany Professor and Mentor.

"The New England Board is providing benefits to underrepresented students of color that no campus alone can do; you are helping these students build hope, community, and confidence and prepare realistically for careers in science and engineering. Bravo!" — Faculty Mentor.

Despite network students' and role models' very favorable evaluations of the meetings and their unprompted, positive correspondence with the organizers on other occasions, there is a clear need to perform more longitudinal evaluation of how students are applying and not applying the lessons learned. In the fall of 1995 at the region-wide Science and Engineering Academic Support Network, a fairly elaborate "pretest" of students was be done before they participate in the network sessions; likewise, a "post-test" and interviews at several six-month intervals will provide valuable follow-up insights. Electronic mail will also be more widely used to track how the students are interacting with one another and with their mentors.

Evolution of the Model

NEBHE is attempting to scale up the networks quickly in order to accommodate more than two to three minority students nominated by each campus or high school. This limit was imposed in the beginning because network advisors wanted to ensure that the smallest schools as well as the largest research universities could nominate and send several students. While the sending campuses have always been expected to underwrite the travel expenses of their students, NEBHE has by necessity learned to be sensitive to the tiny budgets of some campuses and schools and help them raise outside funds or arrange to share bus caravans with more richly endowed institutions. NEBHE organizers have resisted the propensity of some institutions to send their "superstars." The networks are always ready to welcome academically "average" as well as gifted students.

Suggestions for the Future

Network role models and mentors often ask for more time to mingle with one another and enjoy one another's counsel and company. This perennial request from the elders has prompted NEBHE to consider a meeting every other year for them. Elder members have called for more training in mentoring skills for themselves, and this request is being met. What NEBHE is learning from the training process is the subject of a videotape program that is presently in the making and will be available in the next two years.

NEBHE participants also asked for more mentors who are Caucasian. Since 1994 this has been done in order to demonstrate to students that their professional contacts and mentors "can come in all shapes, sizes, and colors," as said by NEBHE advisor Harold Bibb, Professor and Chair, Zoology Department, University of Rhode Island. Approximately 15% of the Science Network mentors are now White, and the percentage will soon move to 25%. Helping these mentors learn to be better mentors to students seemingly unlike themselves is an NEBHE goal, and once this is achieved, NEBHE will then share the model developed with a larger public through both videotapes and written materials.

We have learned that it is a mistake for one keynote speaker at a network meeting to attempt to speak for all the minority groups represented. Having learned this the hard way at its very first meeting, NEBHE is now careful to arrange for four brief testimonial speeches from male and female network mentors and advanced graduate students who represent various ethnic groups at the meeting. Students in the audience are understandably concerned that the group with whom they self-identify should be prominently and fairly spotlighted from the beginning. These diverse testimonials invariably point up the little understood similarities among the groups and almost always underscore how universal are gender problems, no matter what the cultural background and heritage.

NEBHE's greatest frustration is not being completely able to monitor the off-site mentoring that is often taking place among the mentors and their assigned proteges in the Science Network. Because of such different work and study schedules, many mentors and their charges report that they have had to rely far too much on messages left on phone machines. One solution now underway is to get as many Science Network members as possible in the habit of communicating via electronic mail. In addition, the staff members of NEBHE will organize picnics and other face-to-face follow-up meetings for subsets of mentors and their proteges. Off-site mentoring is workable and, indeed, essential for students of color who can find few, if any, mentors of color at their home institutions.

Finally, it has been heartening to see education and business leaders in the six states come forward to become the primary organizers of the state network meetings and to improve on the NEBHE prototype. Every June these organizers are honored at a NEBHE luncheon meeting, and their insights and innovations are incorporated into one another's networking plans as well as NEBHE's region-wide efforts. In addition, several NEBHE network mentors continue to create small spin-offs. The first was started in 1992 by Joan Reede, M.D. , who served as a role model at NEBHE's first region-wide network meeting at MIT in 1990 and who directs Harvard Medical School's Minority Faculty Development Program. In the spring of 1992 and 1994, Dr. Reede organized successful Biomedical Sciences Career Conferences at Boston's Park Plaza Hotel for a total of 600 minority students from New England, most of whom were high school and college students interested in becoming physicians. The students' advisors for the day were drawn from the region's teaching hospitals and medical schools in the area as well as from NEBHE's circle of network mentors. NEBHE contributed extensive technical assistance in assembling the participants and organizing the program for the day, while the Massachusetts Medical Society offered major financial underwriting for the events. Other such spin-offs and specialized networks are expected to continue.

The Essential Role of Advisors and Collaboration

Because NEBHE primarily deals with state legislators, campus and school officials, and business leaders and coalitions, and because prior to 1990 NEBHE had little experience in working directly with minority or majority students, the organization had to draw on the wisdom of others. In charting new territory, NEBHE's leadership drew on its extensive contacts and helped identify key guides. Instrumental from the beginning have been Science Department Chair Kyrsis Rodriguez at Roxbury Community College, an accomplished mentor; Electrical Engineering Department Chair Bill Ohley at the University of Rhode Island, a Native American leader who increasingly works with youngsters in the Narragansett Tribe; Luis Melendez, former president of the Connecticut Association of Latin Americans in Higher Education and currently Director of the Center for Educational Services at Gateway Technical Community College; several key African-American administrators at MIT, including Isaac Colbert, Margo Tyler, Clarence Williams, and Ann Davis Shaw; as well as almost a dozen other leaders of color from all six New England states, including several high school, college, and graduate students.

The organizations providing counsel and assistance with organizing the networks included the New England Association of Educational Opportunity Program Personnel, which includes Upward Bound and Talent Search initiatives; the Massachusetts Pre-Engineering Program which provides academic enrichment to inner-city minority youth in Boston; the New England Association of Schools and Colleges; various statewide associations of high school principals, guidance counselors, and community college presidents; and key deans in the New England Council of Graduate Schools. On NEBHE's own board of directors sit several high school principals, college presidents, all six education committee chairs from the state legislatures, and all six chancellors of public higher education boards or systems in the states. Consulting with these individuals and organizations was wise: After several months NEBHE had the commitment and moral support of a formidable array of allies who continue to help sustain the networking "campaign" first launched in 1990 as well as the several offspring networks.

Conclusion

Mutual aid societies such as the networks are critical for survival and success, in particular for students of color at predominantly White institutions who must cope with psychological isolation and lack of "inside" information about how academia works. But those who organize the student support networks are, in fact, treating the victims of the academic system and not the system itself. How can the academic system itself be changed?

NEBHE — with its regional counterparts, the Southern Regional Education Board and the Western Interstate Commission for Higher Education — have joined together to launch a new financial aid and academic support program for more than 400 underrepresented graduate students of color who are committed to college teaching after receipt of the doctorate. Long-term financial help (including fellowships, teaching and research assistantships over five years); ample opportunities to build support systems with doctoral scholars and faculty mentors from the West, South, and New England; professional enrichment funds to attend professional conferences in their academic disciplines; honing of teaching skills at a Teaching Institute each year primarily organized by NEBHE; job counseling and job-placement assistance when the doctorate is close to completion — these are some of the benefits accruing to the doctoral scholars in the new "Compact for Faculty Diversity" Program underwritten by the Pew Charitable Trusts, the Ford Foundation, various states in the three regions, and participating doctoral campuses. Perhaps more significantly, the New England, Southern, and Western Boards will work closely with each participating doctoral department to ensure:

- that an "environment of support" is being developed to increase the minority students' likelihood of success;
- that by the end of the first year of graduate work each Scholar will have a productive relationship with an attentive and caring faculty mentor within the department;
- that supervised teaching opportunities will be provided in each Scholar's middle years of study to build competency and confidence as a classroom teacher and college professor.

The Teaching Institute will focus on several teaching methods, in particular collaborative learning as practiced by UT-Austin Professor Treisman. The collaborative and community-building approach to college teaching, when mastered by the Compact's Scholars, will counter what Sheila Tobias (1990) has characterized as elitist and wasteful practices in math and science introductory college courses — when the expert professor uses arcane lectures, fierce competition among students, and grading on the curve to "weed out" those deemed unfit. The Compact's Scholars, mostly specializing in math, science, and engineering, will be well equipped to create very different learning cultures in colleges and universities and to prompt their students in the benefits of mutual aid societies and support networks.

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Chapter 12

The American Association for Higher Education: Community Compacts for Student Success

by Nevin Brown

Colleges and universities have had a long history in working collaboratively with kindergarten through twelfth grade educational institutions, this work ranging from creating programs to increase minority high school student access to higher education, to providing professional development opportunities for urban school teachers, to developing more substantive subject matter content for the courses taught in the schools.

However, much of higher education's engagement with schools has remained at the margins. Programs have often reached only small numbers of students and teachers; collaborative initiatives have often remained dependent on short-term funding sources; university faculty engaged in such work often have received too little in the way of institutional recognition or rewards for their efforts; and little connection has been made between school reform and the need for change within higher education institutions themselves. At the same time, a wide range of education leaders at the community, state, and national levels have also drawn increasing attention to the need for dramatic improvements in student achievement in the nation's urban areas, particularly for minority and poor students — improvements which would require an equally dramatic increase in the number and effectiveness of collaborative programs to help *all* students reach much higher levels of academic preparation and success.

Together with the Pew Charitable Trusts, the Education Trust of the American Association for Higher Education (AAHE) has begun a long-term effort, the Community Compacts for Student Success initiative, to help colleges and universities think differently about their engagement with kindergarten through the twelfth grade, to help move toward a more *systemic* way of thinking about university-school collaboration.

Development of the Compact Concept

Some of the ideas underlying the Compact initiative are based on the experience of the Boston Compact, a school-business-higher education collaborative effort which has been in place in Boston since the early 1980s. Robert Schwartz, director of the Education Program at Pew, was a founder of the Compact and remained closely tied to its management for a number of years. Both the positive lessons, such as the willingness of business and other community partners to commit significant resources to improved job and life chances for Boston high school graduates, for example, as well as more negative ones — such as the lesson that collaboration rooted in goodwill still may not produce significant improvements in the academic realities for most urban high school students and, therefore, that collaboration for deeper changes in kindergarten through twelfth grade education is a much more difficult, long-term enterprise than many had anticipated — have been important in Pew's conceptualization of the current Compact effort.

In addition, the AAHE Education Trust has had a number of years of experience in sponsoring national conferences and initiatives on the subject of school-college collaboration as well as in sponsoring a number of publications such as the national directory of school-college partnerships, *Linking America's Schools and Colleges*. The Trust has engaged in extensive work and conversation with many leading scholars and practitioners in the areas of education reform and school-college collaboration and has integrated their knowledge and experience into its own approach to kindergarten through college ("K–16") reform work, particularly in the Community Compacts for Student Success initiative.

AAHE itself is an organization deeply committed to the common cause of improving the quality of higher education. Since its inception in 1969 as an organization of individual "citizens" drawn from every sector in higher education, AAHE has organized conferences, publications and special-interest projects to help its members translate into action their convictions that higher education should play a larger role in national life and that every postsecondary institution can be more effective in fostering teaching and learning. AAHE has been deeply engaged in collaboration with elementary and secondary schools for over a decade, including sponsorship of an annual conference on school-college collaboration, development of periodic national directories of school-college collaboratives as well as other publications, and sponsorship of specific initiatives including the Community Compacts for Student Success.

The Model

Imagine for a moment a school-college collaborative effort that merged all the physical plant, motor pool, and other management functions of a university and a school district into a single entity; or that engaged minority parents and local community leaders in the redesign of a university's teacher education program; or that broke down large impersonal high school buildings and large college lecture classes in the same city into small "learning communities." Then imagine that these and many other similar reforms are already going on in a diverse set of communities across the nation, and you have the Community Compacts for Student Success. The Community Compacts for Student Success initiative seeks to make schools and universities as a whole — indeed, whole educational systems — work more effectively for all students, especially those who are poor and minority. The Compacts' initiative is based on these underlying beliefs:

- that *all* students have the potential to succeed in postsecondary-level work and should be educated as if they were bound for college or university;
- that closing the achievement-college success gap requires fundamental change in the way both schools and universities do their work;
- that the improvement of teaching and learning must be at the heart of any change strategy;
- that student achievement data, properly displayed, analyzed, and reported, can and must be an essential tool in the creation of any change strategy;
- that real change is most likely when school systems and universities engage in collaboratively planned, simultaneous reform;
- that strong community voices must be engaged in the reform discussion;
- and that partners in reform must commit to at least a decade-long effort to mount, sustain, and mobilize community support for the reform initiative.

The Compacts initiative began at the end of 1991, when Pew and the AAHE Education Trust invited college presidents, school superintendents and others to submit proposals for one-year $40,000 planning grants to develop long-term strategies for systemic education reform in their communities. Proposals were received from over 100 institutions and communities across the nation. Twenty of these received site visits

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during the winter of 1992 from AAHE and Pew staff members. Ten communities were selected that spring to receive the initial planning grants: Birmingham, AL, Boston, MA, El Paso, TX, Gary, IN, Hartford, CT, Philadelphia, PA, Phoenix, AZ, Portland, OR, Providence, RI, and Pueblo, CO.

Each of the ten communities engaged in a twelve- to eighteen-month planning effort based on gathering and using kindergarten through twelfth grade and postsecondary student achievement data, in a process led by broadly representative working committees composed of kindergarten through twelfth grade and postsecondary administrators and faculty members, businesses, community-based organizations, parents and other education stakeholders in each city. Out of this process, six communities were able to develop strategies for long-term systemic education reform in which (as of mid-1995) Pew is investing more significant support — $150,000 annually per site — during the next three years, with potential continuation for another three years. These communities are:

Birmingham (Birmingham Compact)
El Paso (El Paso Collaborative for Academic Excellence)
Hartford (Hartford Urban Education Network)
Philadelphia (North Philadelphia Community Compact for College Access and Success)
Providence (Providence Community Compact for Student Success)
Pueblo (Pueblo Community Compact)

Each Community Compact engages leaders from universities, two-year colleges, urban school districts, businesses, and community-based organizations in intensive work to develop and implement *systemic* strategies for improving academic achievement and success for all students from kindergarten through the baccalaureate degree. While a universally-accepted definition of "systemic" is still to be written, Pew and the AAHE Education Trust emphasize the need to take a K–16 approach to education reform — that change at the postsecondary level is as necessary as change from kindergarten through twelfth grade. In addition, the strategies being undertaken in the six Compact communities incorporate five elements which Pew and AAHE believe are central to systemic reform:

- the establishment of clear, high goals and standards for all students;
- the use and public disclosure of data on student achievement at all levels;
- the shifting of authority and responsibility for teaching and learning to the school building and university department levels;
- the providing of professional development support structures to students, teachers, faculty members, administrators, and parents;
- and the development of accountability systems with real consequences for success and failure for schools and departments, professionals and students.

The overall direction of each local Compact is guided by a board of directors, policy steering committee or similar group composed of key college and university presidents and chancellors, both two-year and four-year, the local school superintendent(s), and key community leaders (including corporate executives, public officials, heads of community-based organizations and parent groups, and the like). The day-to-day work of each Compact is directed by a person who is designated as the Compact coordinator or manager and who commits at least half of his or her time to the position. In some cases, the manager is a university faculty member, in others a school district administrator, and in others is housed in a separately incorporated entity. In some communities, such as Birmingham and Providence, co-managers have been appointed from the university and the school district. In all cases, however, the ability of the Compact manager or coordinator to facilitate communication among the many (and sometimes conflicting) community stakeholders in education has been a key to the initial effectiveness of local Compacts and, indeed, to their ability to receive long-term support from Pew.

The range of activities undertaken by each local Compact is quite broad and will be discussed in greater detail in the next section. Here, however, are some general observations about issues guiding the Compacts in their first year of work:

- Each Compact is attempting to pursue both a "top-down" and "bottom-up" change strategy. Basic support for engagement in systemic reform work is created within the top leadership group, but the development and implementation of specific strategies and programs occurs at the "grassroots" level — from faculty members, school and department administrators, community leaders, parents and others who deal with student retention and achievement issues on a daily basis. Each of the six Compact communities can show significant engagement at both the institutional leadership and the community and classroom levels, as well as by persons at many points between.

- The development of new strategies to improve student achievement, or the reorientation of those already in place, has not inevitably led to the creation of many new programs and projects. The work of the Compacts has often been as much or more about the redirection or reallocation of *existing* programs and resources in order to have a more significant impact on the academic success of larger numbers of students. For example, the work of the North Philadelphia Compact has been based significantly on the effort of the Philadelphia Schools Collaborative to create charter schools within the city's high schools; many of the strategies proposed in Providence are building on a wide range of existing programs between the University of Rhode Island and the Providence School Department; and the health-related strategies of the Birmingham Compact will incorporate already-operating collaborative relationships between the University of Alabama at Birmingham and the surrounding community.

- A fundamental idea guiding Compact work is the creation of systemic reform strategies across the education continuum, not simply at the kindergarten through high school levels. If there is an idea that may be particularly "radical" about the Compact approach, it is the belief that *both* kindergarten through twelfth grade and postsecondary education need to reassess what they are doing in order to have a bigger impact on the educational success of much larger numbers of students. Each of the six Compact communities has proposed a set of strategies for change at the postsecondary level, some of which will be described later in this article. All the Compacts are finding that *engaging* postsecondary institutions in a mutual reform effort with kindergarten through twelfth grade will be one of the most difficult, challenging aspects of their work.

Access and Retention Issues Through Collaboration

How are the Compact communities addressing access and retention issues for students at both the elementary, secondary, and postsecondary levels? Currently, Compacts have the following as their goals:

- *Improvement in the quality of kindergarten through twelfth grade teaching and curriculum*: Several Compacts are focusing significant time and attention on long-term professional development for kindergarten through twelfth grade faculty members and principals in inner-city, low-income schools, both to improve faculty content knowledge in subject areas such as mathematics and science and to build school-based teams to work on and support each other in more systemic approaches to improve the academic success of all students in their schools. El Paso is entering its third year of such institute work during 1995, and Birmingham began its first institutes during the summer of the same year.

- *Improvement in the quality of teaching and teacher preparation at the postsecondary levels*: Several Compacts are devoting energy to reshaping the quality and content of teacher education programs within postsecondary institutions, as well as addressing the need for improving the quality of undergraduate teaching by college faculty. The University of Texas at El Paso is reshaping its entire teacher education approach as a part of the Compact work in that city; Pueblo is developing a single entity which will provide resources and professional development for the improvement of teaching and learning for faculty both in the participating school districts and the participating four-year university.

- *Providing students more conducive learning environments*: Many Compact communities have proposed or are now engaged in developing smaller learning communities at both the high school and postsecondary levels; efforts include the creation in Philadelphia of charter schools (or "schools-within-schools") within large comprehensive high schools, linked to the creation of small "learning communities" within the two- and four-year higher education institutions involved in Compact work. In order to create more conducive environments in which their students can flourish academically, several Compact communities are developing small, face-to-face communities in which students are known and supported and in which their contributions are valued. Note that the terminology for these smaller, human-scale units can vary widely from place to place. For example, these small communities known in Philadelphia's high schools as "charter schools" or "schools-within-schools," are known at postsecondary institutions such as Temple University or the Community College of Philadelphia as "learning communities."

- *Helping students at key transition points:* All the Compacts are focusing greater attention on key transition points at which students seem most often to disappear from the education continuum — into middle school, from middle school to high school, from high school to postsecondary institutions and, within the postsecondary sector, from two-year to four-year programs. In this context, Hartford is focusing on improving information to parents and students about the options that exist around transitions so that they can make good choices, as well as focusing attention on the key role of the city's community or technical college in helping minority and other students prepare for four-year programs; Providence will focus attention on improving both the quality of counseling and guidance at the school and college levels as well as reconnecting school faculty as key players in student academic advising.

- *Creating higher expectations for college-going among urban students*: Several Compacts are focusing significant attention on the need to build community and family traditions of college-going for minority and low-income youth, so that college education or the academic preparedness necessary to go to college will be seen community-wide as a part of every child's future. Hartford is placing a particularly strong emphasis on the rebuilding of a college-going tradition among its students, using mechanisms such as a Student Success Corps in each Hartford school to connect current students with local college students who are themselves graduates of the Hartford schools.

Evidence of Success

The six Community Compacts have been implementing their Pew-supported strategies since mid-to-late 1993, and therefore it is difficult to point yet to a direct effect of Compact work on the academic success and achievement of poor and minority students. However, three long-term aspects of the Compact work as initiated by Pew and AAHE should help produce evidence regarding the success of local strategies as well as that of the overall program:

- Each Compact community is required to gather student achievement and retention data for grade seven through the second college year throughout the period of current Pew funding. This includes exit surveys of each graduating high school student in the six communities, or from high schools targeted by Compact strategies, as well as follow-up surveys of stratified samples of these students six and eighteen months after high school graduation. Already as a result of their Pew-supported work, several of the Compact communities have developed or are close to developing consistent student tracking systems, K–16, which will enable them to follow large numbers of students well beyond the two- to five-year period of current Pew funding. It seems reasonable to expect, therefore, that evidence regarding the success of the Compact strategies will be available and reasonably clear within the next few years.

- The AAHE Education Trust is working closely with a Washington-based evaluation organization, Policy Studies Associates, to develop an overall qualitative as well as quantitative evaluation of the Compact initiative, both at the six sites as well as overall. One major aspect of the evaluation plan, completed in the summer of 1994, involves the use of local on-site evaluators drawn from each Compact community to gather both numerical as well as ethnographic information on the work and impact of each Compact. Again, the overall evaluation will be conducted over the next two years, with possible extension for another three years if some or all of the local sites receive continued support from Pew for their work; therefore, an internal AAHE report regarding the effectiveness of the Compact approach overall is being compiled and should be completed in 1996.

- Finally, a number of other communities around the nation have approached the AAHE Education Trust during the past year with an interest in learning more about the work of the six Compact communities and the possibility that a similar approach might be developed in their localities. Given the growing level of interest in such possible Compact replications, the Education Trust has begun a second effort, its K–16 Initiative, to help seed such similar systemic reform efforts elsewhere in the nation. Two introductory meetings were held in Washington, DC, and St. Louis, MO, during 1993 in which school, university and community representatives from nearly 25 cities participated. Many of those communities are now developing local K–16 councils and have been participating in a series of K–16 institutes during 1994 and 1995. Some of the communities becoming involved in the K–16 Initiative include Portland, OR, San Francisco, CA, Reno, NV, Dallas, TX, and Akron, OH. The level of interest being shown in the K–16 Initiative, and, therefore, in the Compact initiative on which it is based, is another indication of the potential for success in improving student achievement in a range of cities and communities across the nation.

Conclusions and Recommendations

by Nancy Carriuolo

The preceding chapters about partnerships describe just a small portion of the activity being undertaken across the nation and, in some cases, abroad. Increasingly, educational institutions have realized that the only way to produce students better prepared for work and further education is to work with each other as well as with public and private organizations interested in education in order to set clear goals and realize them. The American public will accept nothing less.

The following recommendations will help to facilitate the development of strong educational collaboration.

1. Devise appropriate incentives and rewards.

   Devise a system of incentives and rewards that will break down the long-standing pecking order that separates schools from colleges. Young, energetic professors will hesitate to spend their time working with schools if they are signaled by their institution's tenure and promotion system that teaching and research are valued, not collaboration with schools and other community groups. Teachers also have limited time and energy. If working with college professors is a priority, then teachers should be given incentives that are valuable to a teacher.

2. Identify all stakeholders and seek continuously their advice and consensus.

   Ensure that teachers and students are involved in decision-making at the earliest stages and that they are continuously consulted about and kept informed of the partnership's plans. Ownership, mutual respect and trust are all vital to early and continuous cooperation and the ultimate success of a partnership. Also, ensure that all stakeholders who have extant programs with the school are invited to join the larger partnership effort being undertaken. In addition, invite anyone else in the community who may not have been previously involved but who has a stake in the success of education (e. g., do not forget to invite developmental educators and persons in charge of retention).

3. Establish goals everyone can agree upon and then simplify activities.

   A truly effective partnership will unravel the complex web of programs being undertaken within schools by various external groups. An examination of existing programs is important in order to identify ways to eliminate overlap of programs and, in some cases, conflicting goals.

4. Embed the partnership within the community

   Create a partnership that is neither dependent upon the support of the current leadership of an institution or organization nor dependent upon external funding; embed the partnership locally. A partnership that is forced to constantly search for new funding will in time grow so focused on the pursuit of grant dollars that it will lose sight of its educational purposes. By leveraging school, college, and community funds, a partnership should be able to rest solidly on local support. (In most cases the community will be local but the definition of community can be as wide as the partnership's vision.)

5. Seek a few good leaders and many grassroots workers and active supporters.

   Actively recruit new membership from which new leaders can be nurtured. A partnership can never have too many grassroots workers and supporters, all of whom bring resources of a personal and professional nature, and possibly of a financial nature. A small group of leaders should steer a partnership. Remember that a supporter does not need to attend every meeting but will respond when called upon.

6. Form reciprocal relationships among equal partners.

   Ensure that each participating institution feels that some of its needs are being met by the collaboration. Partnerships are relationships, so they must involve reciprocity. For some partner institutions, even recognition can be an important reward.

7. Value and respect the differing perspectives and cultures of partners.

   Schools, colleges, businesses, community groups, and other organizations all have somewhat different ways of conducting their affairs. Groups need to take time to understand, value, and accommodate differences. For example, meetings scheduled at 3:00 p.m. may be fine for a teacher but not for a business person.

8. Regularly review the short- and long-term plans of the partnership, and assess progress.

   Review and revise partnership plans on the basis of retention and gather data that fairly and accurately reflect the partnership's impact on students' success. Compare data such as graduation rates before and after intervention by the partnership. Above all, remember that no only elementary schools, middle and high schools but also colleges and universities need to change in order to move greater numbers of students successfully through the pipeline.

9. Take time to publicize and celebrate collaborations.

   The greatest credence for collaboration is student success, and this must be publicized widely. In order to gain new supporters and retain long-standing supporters, a partnership must find ways to show the community its success, and find ways to applaud its supporters.

10. Learn from the experiences of others.

    The organizations and individuals cited in the resource section of this monograph are devoted to educational collaboration and are eager to assist newcomers to the movement. Borrowing and sharing are the essence of collaboration. By working together as a network of collaborators, we can all make our partnerships a little stronger as we move into the twenty-first century.

Appendix

The following national or regional organizations support collaboration between schools and colleges and other educational partners. Each organization has provided a contact person who can be reached for further information about the services and information listed below. Many other organizations also function on the state level. Contact your State Department of Education for additional resources.

American Association for Higher Education
One Dupont Circle, NW, Suite 360
Washington, DC 20036
Telephone: (202) 293-6440
Telefax: (202) 293-0073
Contact:
Education Trust
Resources:
Annual conference on school-college collaboration; information on current Compact sites; quarterly newsletter, *Thinking K-16;* information on developing kindergarten through college councils in local communities; legislative updates on Title I/Chapter I; research and programmatic services, and information regarding professional development, standards, and the high school-to-college transition process.

American Council of Education
Office of the Business Higher Education Forum
One DuPont Circle
Washington, D.C. 20036
Telephone: (202) 939-9345
Telefax: (202) 833-4723
Contact:
Judith T. Irwin, Associate Director
Resources:
The Business-Higher Education Forum, founded in 1978 by the American Council on Education, is a membership organization of 80 academic and corporate chief executives from major American businesses, colleges and universities. Their goals are to address issues of mutual concern to the corporate and higher education communities and to build consensus on how the two sectors can collaborate more effectively for the benefit of all society. To carry out its agenda, the Forum holds semiannual meetings, convenes occasional roundtables, publishes policy reports, conducts citizen-education campaigns, and manages projects that mobilize the resources of its multinational members.

American Council of Learned Societies
228 East 45th Street
New York, NY 10017
Telephone: (212) 697-1505, ext. 139
Telefax: (212) 949-8058
Contact:
Michael Holtzman
Resources:
Advice only. The ACLS is in the second year of a three-year project. Delegates of school-based teams spend one year learning research resources of the university in support of curriculum development at their schools.

American Council for the Teaching of Foreign Languages (ACTFL)
Six Executive Plaza
Yonkers, NY 10701
Telephone: (914) 963-8830
Telefax: (914) 963-1275
Contact:
Jamie Draper, Member Liaison
John E. Miles, Director of Professional Development
Resources:
ACTFL has a large network of members who collaborate; therefore, they will provide referrals for specific information. Materials and publications; will publicize programs through their newsletter.

American Physical Society
American Center For Physics
One Physics Ellipse
College Park, MD 20740-3844
Telephone: (301) 209-3233
Telefax: (301) 209-3865
E-mail: schwartz@APS.ORG
Contact:
Dr. Brian Schwartz
Resources:
Workshops, newsletter, and access to local school and college physics faculty interested in working on school-college collaboration in the area of physics; information on how to start an alliance, and mini-grants (around $50.00)

Association for Supervision and Curriculum Development
1250 North Pitt Street
Alexandria, VA 22314-1453
Contacts:
Susan Hlesciak Hall, Public Information Manager (for press queries and policy-related information)
Telephone: (703) 549-9110, ext. 502
Telefax: (703) 549-3891; 703-836-7921
Lisa Street, information specialist (for general information on education topics)
Telephone: (703) 549-9110, ext. 507
Telefax: (703) 549-3891; 703-836-7921
Resources:
Mini-searches for ERIC abstracts and ASCD articles; an ASCD resource list of products (audiotapes, books, videos, and back issues of *Educational Leadership*); and upcoming workshops, networks, and other sources of information.

Citizens' Scholarship Foundation of America, Inc. (CSFA)
47 Thorndike Street
Cambridge, MA 02141-1714
Telephone: (617) 494-8401
Telefax: (617) 494-8459
Internet: dol4scholr@aol.com
Contacts:
Steve Pratt, Program Director, Citizens' Scholarship Foundation of America, Inc.
Mary Mack-Callahan, Managing Director.

The College Board
45 Columbus Avenue
New York, NY 10023-6992
Telephone: (212) 713-8214
Telefax: (212) 713-8304
Contact:
Robert Orrill, Executive Director of Academic Affairs
Resources:
Publications, models, projects, advice, and networks.

Consortium for the Advancement of Private Higher Education (CAPHE)
One Dupont Circle, Suite 320
Washington, DC 20036-1110
Telephone: (202) 466-7230
Resources:
CSFA and CAPHE are partners in managing a national effort focused on disadvantaged youth, funded by the DeWitt Wallace-Reader's Digest Fund's High School-to-College Transition Initiative. Twenty partnerships between private colleges or universities and community organizations have been established. Although funding for this project is currently closed and they are not at this time entertaining proposals, they hope to again in the future. CSFA can provide information about the progress of the current partnerships, advice on setting up community-based scholarship funds, and a national monthly publication, *CSFA News*.

Education Commission of the States
707-17th Street, Suite 2700
Denver, CO 80202-3427
Telephone: (303) 299-3676
Telefax: (303) 296-8332
Contact:
Sandra Ruppert
Resources:
Advice on the role of states in school-college collaboration (state-level policy issues).

Foundation Center
79 Fifth Avenue
New York, NY 10003
Resources:
The Foundation Center is an independent national service organization established by foundations in 1956 to provide an authoritative source of information on foundation and corporate giving. Its New York, Washington, DC, Atlanta, Cleveland, and San Francisco reference libraries provide free access to information on foundations and grants. Cooperating Collections, in libraries, communities, foundations, and other nonprofit agencies house a core collection of Foundation Center publications and a variety of supplementary materials and services. Because the Collections vary in their hours, materials, and services, it is recommended that you call the library you wish to visit in advance. To check on new locations or current information, call 800-424-9836.

National Field Offices:

The Foundation Center
8th Floor
79 Fifth Avenue
New York, NY 10003
Telephone: (212) 620-4230

The Foundation Center
312 Sutter St., Room 312
San Francisco, CA 94108
Telephone: (415) 397-0902

The Foundation Center
1001 Connecticut Avenue, NW
Washington, DC 20036
Telephone: (202) 331-1400

The Foundation Center
Kent H. Smith Library
1422 Euclid, Suite 1356
Cleveland, OH 44115
Telephone: (216) 861-1933

The Foundation Center
Suite 150, Grand Lobby
Hurt Building, 50 Hurt Plaza
Atlanta, GA 30303
Telephone: (404) 880-0094.

History Teaching Alliance
Department of History
University of Tulsa
600 South College Avenue
Tulsa, OK 74104-3189
Telephone: (918) 631-2349
Telefax: (918) 631-2057
E-mail: HIST_clc@vax1.utulsa.edu
Contact:
Christine L. Compston, director
Resources:
Work with individuals and groups to design and develop a collaborative; currently working on organizational workshops that will result in a handbook on beginning and sustaining a history collaborative; a clearinghouse for information on history collaboratives and alliances.

"I Have a Dream" Foundation
330 Seventh Avenue
New York, NY 10001
Telephone: (212) 736-1730, ext.14
Telefax: (212) 736-1852
Contact:
Charles Chesnut, Director of Communications
Resources:
"I Have a Dream"® is a comprehensive, long-term educational support program for disadvantaged children. Local projects adopt entire grades (usually the 3rd or 4th) from elementary schools, or corresponding age-groups from public housing developments. Each Project then provides its "Dreamers" with academic support, cultural and recreational activities and individual attention for ten to twelve years. Once Dreamers graduate from high school, the foundation provides tuition assistance for

college or vocational school. Local projects bring together a wide variety of community resources. The foundation works closely with local schools, businesses, colleges and universities, housing authorities, religious and civic groups, youth development programs and social service organizations.

InfoMedia, Inc.
P.O. Box 210
Ellenton, Florida 34222-0210
Telephone: (813) 776-2535
Resources: books, journal, annual national partnership award that has a school-college category, and annual conference on educational reform.

Mathematicians and Education Reform Network (MER)
University of Illinois at Chicago
Department of Math, Statistics, and Computer Science
851 South Morgan
M/C 249
Chicago, IL 60607
Telephone: (312) 413-3749
Telefax: (312) 996-1491
Contact:
Naomi Fisher
Resources:
The MER Newsletter; information on math education programs that promote reform.

National Alliance of Business
1201 New York Avenue, NW
7th Floor
Washington, D.C. 20005-3917
Telephone: (202) 289-2900
Telefax: (202) 289-1303
Contact:
Sandra Byrne
Resources:
Advice, publications on business-education partnerships, youth apprenticeship programs, workshops, and an annual business education forum held in the spring.

National Association of Partners in Education
209 Madison Street, Suite 401
Alexandria, VA 22314
Telephone: (703) 836-4880
Telefax: (703) 836-6941
Contact:
Janet Cox, Director of Communications
Resources:
Advice regarding school-business partnerships, workshops, newsletter (*Partners in Education*) published monthly (except for July and August), national conference, state and regional conferences.

National Center for Academic Achievement and Transfer
Contact: Judith Eaton
Telephone: (212) 661-5800
Resources:
Information regarding transfer from two-year to four-year institutions of higher education.

National Council of Educational Opportunity Associations
1025 Vermont Avenue, Suite 1201
Washington, D.C. 20005
Telephone: (202) 347-7430
Telefax: (202) 347-0786
Contact:
Katie McGraw, Executive Assistant
Resources:
Advice regarding the needs of disadvantaged students and publications on securing funding.

National Council for History Education, Inc.
26915 Westwood Road, Suite B-2
Westlake, OH 44145-4656
Telephone: (216) 835-1776
Telefax: (216) 835-1295
E-mail: ae515@cleveland.freenet.edu
Contact:
Elaine Reed
Resources:
Provides advice, publications, conferences, and workshops.

National Endowment for the Humanities
1100 Pennsylvania Avenue, NW
Washington, DC 20506
Telephone: (202) 606-8377
Telefax: (202) 606-8394
Contact:
Ralph Canevali
Division of Education Programs (Elementary & Secondary Education)
Resources:
The National Endowment for the Humanities provides guidelines, application forms, and advice on applying for a grant. The grants support projects that join teachers at elementary and secondary level with humanities professors to provide teachers the opportunity for study, personal and professional enrichment.

National History Education Network
Department of History
University of Tulsa
600 South College Avenue
Tulsa, OK 74104-3189
Telephone: (918) 631-2349
Telefax: (918) 631-2057
E-mail: HIST_clc@vax1.utulsa.edu
Contact:
Christine L. Compston, Director
Resources:
Clearinghouse on history information; quarterly newsletter; institutes, workshops, programs that teachers might be interested in; track state and federal legislation pertaining to history education; advocate history education; review of curriculum for groups.

National Science Foundation
Division of Undergraduate Education
4201 Wilson Boulevard
Arlington, VA 22230
Collaboratives for Excellence in Teacher Preparation Program
Telephone: (703) 306-1669
Telefax: (703) 306-0445
E-mail: twoodin@nsf.gov
Contact:
Terry Woodin
Resources:
The NSF Collaboratives for Excellence in Teacher Preparation (CETP) Program provides major support for comprehensive change in the undergraduate preparation of future teachers. The program supports cooperative, multi-year efforts to increase substantially the quality and number of teachers well-prepared in science and mathematics, especially members of under-represented groups. Collaboratives derive from the leadership and participation of faculty members in science, mathematics, engineering, and technology, in concert with colleagues in education departments and in the kindergarten through twelfth grade teaching community. For information consult the Program Announcement and Guidelines for the Division of Undergraduate Education, available from NSF or electronically using STIS through the internet gopher.

National Science Foundation
Education and Human Resources Directorate
4201 Wilson Boulevard, 8th Floor
Arlington, VA 22230
Telephone: (703) 306-1682
Telefax: (703) 306-0456
Contact:
Janice Earle, Senior Program Director
Statewide Systemic Initiatives
Resources:
Partnership advice; publications that describe each state's initiatives; evaluation of the Statewide Systemic Initiative.

New England Association of Schools and Colleges, Inc.
209 Burlington Road
Bedford, MA 01730-1433
Telephone: (617) 271-0022 ext. 307
Contact:
Eva Kampits, Director of the Office of School/College Relations
Resources:
Publications, videos, and on-site or telephone consultations with the six New England states.

New England Network of Academic Alliances in Foreign Languages and Literatures
Brookline Public Schools
Town Hall
333 Washington Street
Brookline, MA 02146
Telephone: (617) 730-2429
Telefax: (617) 730-2108
Contact:
Claire Jackson
Assistant Superintendent for Curriculum and Instruction
Resources:
Advice in establishing an academic alliance for foreign language faculty from kindergarten through college; information on the *Articulation and Achievement Project*, a project to establish articulated learning outcomes for foreign language students.

Southern Regional Education Board
592 10th Street, N.W.
Atlanta, GA 30318-5790
Telephone: (404) 875-9211
Telefax: (404) 872-1477
Contact:
Joseph Creech, Associate Director for Educational Policies
Resources:
Advice on academic alliances and publications on colleges reporting to high schools on college performance.

State Higher Education Executive Officers
707-17th Street, Suite 2700
Denver, CO 80202-3427
Telephone: (303) 299-3657
Telefax: (303) 296-8332
Contact:
Esther Rodriguez
Resources:
Information regarding school-college collaboration from the 50 states and the District of Columbia relating to state level initiatives (policies, executive orders, and agency policy); publications.

Syracuse University
Project Advance
111 Waverly Avenue
Syracuse, NY 13244
Telephone: (315) 443-2404
Telefax: (315) 443-1524
Contact:
Franklin Wilbur, Director
Resources:
Descriptive information (literature), advice in beginning and sustaining academic alliances in schools, professional services, and information regarding concurrent enrollment programs. Syracuse University is the home of the National Center for Research and Information on School/College Partnerships. The Center maintains a national data base regarding school-college collaboration.

Yale-New Haven Teachers Institute
P.O. Box 203563
New Haven, CT 06520
Contact:
James R. Vivian, Director
Resource:
On Common Ground, a periodical on strengthening teaching through school-university partnership.

About the Author and Contributors

Nancy Carriuolo

Author

Nancy Carriuolo is currently the Acting Dean of Arts and Sciences at the University of New Haven, in West Haven, CT. Previously she served as Director of the Office of School/College Relations at the New England Association of Schools and Colleges, Inc. (NEASC) in Bedford, MA. In March 1990 the NEASC became the first and only regional accrediting association to establish an office to promote collaboration between its member schools and their local colleges and universities. In her position at the NEASC, Carriuolo raised a quarter of a million dollars from local foundations to support collaboration in New England. Her office provided not only seed money, but also technical assistance and information to scores of newly-forming partnerships in New England's six states.

Carriuolo's interest in school-college collaboration dates to the 1970s when, as a high school teacher, she participated in a partnership. Later, she was active in partnerships with elementary, middle, and high schools when she became an administrator and professor at the University of New Haven in the 1980s. Carriuolo has also been a long-standing supporter of at-risk students' access to and retention in college. In the 1980s as Assistant Provost for Students' Academic Development at the University of New Haven, she was in charge of the University-wide retention program. She is also a past president of the National Association for Developmental Education (NADE).

Carriuolo has published essays on partnerships in periodicals such as *Education Week* and edited *Beginning and Sustaining School/College Partnerships*, a collection of essays on the methods of educational collaboration. She is also the author of numerous publications on the subject of so-called at-risk students, including two essays in *The Chronicle of Higher Education*. She recently received a Townsend Press award for her writing.

Nevin Brown

Nevin C. Brown is currently a principal partner with the Education Trust of the American Association for Higher Education (AAHE). His primary responsibilities include working with community-based school-university collaborative programs in a number of cities and metropolitan areas nationwide through AAHE's K–16 and Community Compacts for Student Success Initiatives, as well as coordinating the first stages of a national K–16 council to provide a more effective higher education voice of advocacy for systemic education reform. Prior to joining the AAHE staff at the end of 1991, Brown headed for twelve years the Division of Urban Affairs of the National Association of State Universities and Land-Grant Colleges (NASULGC), where he also directed a program of urban university-urban school collaboratives in sixteen cities across the nation. An historian by academic training, he has spent most of his professional career working in the areas of urban policy and education. Brown was a member of the governing board of the Urban Affairs Association from 1985 to 1991, and has served on the editorial boards of several journals, including the *Journal of Urban Affairs*, *Metropolitan Universities*, and *Urban Affairs Quarterly*. Brown received a B.A. with highest honors in history from the University of California, Santa Barbara in 1972 and an M.A. in American history from the University of Virginia the following year. He was also a Danforth Graduate Fellow from 1972 to 1976.

Peter Budryk

Peter Budryk is a Lecturer in Education at Wesleyan University, in Middletown, CT ; is Director of the Wesleyan Upward Bound/ CONNCAP Program; Founder and Executive Director of Wesleyan's Great Hollow Wilderness School; and Program Developer for EXCEL, a joint Wesleyan-Middletown Schools program for at-risk seventh and eighth grade students who have college potential. He is a former teacher of English in Cambridge and Newburyport, Massachusetts. Budryk earned a Bachelor's Degree from Boston College, a Master's Degree from Harvard University, and a Certificate of Advanced Graduate Study from Southern Connecticut State University. He has been on the staff at Wesleyan since 1968. Prior to 1968, he served on the founding staff as a public school liaison for the first Harvard University Upward Bound Program in 1965-66 through 1968.

Victor Ellsworth

Victor Ellsworth is currently Chair of Music Education in the College of Musical Arts at Bowling Green State University, Bowling Green, OH. He earned music education degrees from the University of North Texas, the Eastman School of Music and a doctorate in curriculum and instruction from the University of Wisconsin – Madison. He is a professional musician who has spent a lifetime in all aspects of music performance from rock and jazz to classical music as a double bassist. He has also worked as a contractor and musician for several Public Radio and Television productions. Prior to assuming duties as a string and orchestra music education specialist at Bowling Green State University and beginning the Music Plus outreach project, Ellsworth was a public school music teacher in Brown Deer, WI, a suburb of Milwaukee, an instructor in the Music Department with duties at the University Laboratory School at Florida State University in Tallahassee, FL, and a public school music teacher in Camillus, NY, a suburb of Syracuse: His experiences in the public schools have led to a commitment to seek ways to make available to deserving but economically disadvantaged students opportunities which might otherwise be denied. Ellsworth has presented the Music Plus Model at the national Music Educators Conference Convention in 1994 and is currently working with other Ohio institutions to promote the Music Plus concept both for music and non-music units.

Amy Emler-Shaffer

Amy Emler-Shaffer has been director of the Women in Technology Project at Vermont Technical College since 1991. After completing her Bachelor of Science degree at Pennsylvania State University, in University Park, PA, she spent almost 10 years working for the U. S. Department of Agriculture. Between her college and work experiences, she has had opportunity to witness the unfortunate imbalance between the numbers of women and men employed in science fields. Her current position with the Women in Technology Project allows her to pursue her interests in science and women's issues concurrently.

Harold J. Haskins

Harold J. Haskins has been an administrator at the University of Pennsylvania, in Philadelphia, PA, for more than twenty-two years. Most of that time has been spent designing and incorporating student retention activities through several key responsibilities at Penn, originating in his role as Associate Dean of Students in 1972, to his current function as Director for Student Developmental Support Planning.

Haskins has developed several student support systems at Penn, most of which feature school-university collaborations and corporate-university partnerships. These systems consist of three interrelated components — the University's Pre-College Programs, Academic Support Services, and Career Development Initiatives — and these components have been incorporated as permanent retention activities for undergraduates at the University. Initiatives structured by Haskins include a university-wide Tutoring Center, a Pre-Freshman Program for high-risk matriculants, Summer Internships sponsored by corporations and academic departments, and the LEAD Program at the Wharton School.

As Vice President for Community Development at Temple University Health Sciences Center, in 1967, he produced a film, *The Jungle,* featuring teenage gang life in North Philadelphia. This film was a catalyst for a number of the gang members who acted in the film to return to high school to earn their diplomas. Several members continued their education and earned college degrees. As a result of the national recognition the film received, the 12th and Oxford Street gang formed a corporation, focussed its energies on economic development projects, and established several legitimate businesses in the neighborhood.

Haskins received his bachelor's degree from Temple University, in Philadelphia, and a master's degree in Regional Planning from the University of Pennsylvania. He has held several positions in higher education administration at Temple and Penn since 1965.

A. Patricia Jaysane

A. Patricia Jaysane is Executive Director of the Merrimack College Urban Institute and holds a doctorate in Linguistics from Université Laval, Québec, Canada. She has taught English and Literature at Merrimack College and Hampshire College, both in Massachusetts, the Université du Québec a Rimouski, and the University of Hartford, in West Hartford, CT. She developed or taught courses in English as a Second Language at Merrimack, Universite Laval, and St. Patrick's High School in Quebec.

One of her central responsibilities at the Urban Institute is educational research and the development of interactive programs between colleges and schools, including professional development for teachers, curriculum revision, evaluation, and creation of enrichment programs for minority and disadvantaged students in order to improve access to higher education. Accept the Challenge, the Focus in Transition program, and the RAISE program are all results of this work.

James E. Kowalsky

James E. Kowalsky received his bachelor's and master's degrees in music education and in performance at the University of Wisconsin – Madison, in 1957 and 1963 respectively. He has taught public school vocal and instrumental music in Wisconsin and Alaska eight years, and instrumental music and music education at colleges in Wisconsin, Kentucky, and Minnesota for six years.

His interest in working with young Alaska Native students to help achieve postsecondary success was a direct result of years of treks into Alaska's wildlands, and through his advocacy work on behalf of rural Native people. During these experiences and his forays into resource politics, he learned to respect the fact that primarily Alaska Native society, Alaska's first inhabitants, are those who live in Alaska Native homelands surrounded by the wilderness lands and resources that are so coveted by urban American society.

Kowalsky believes that urban interests, from environmentalists to government to resource developers, influence directly most decisions that affect these rural areas while those living on such lands all too often have little or nothing to say about the whole matter. He believes that a rural society, provided with educational opportunities not only in its own cultures and traditions but also in Western traditions, will best achieve self-determination and self-governance and will have far greater impact on the manner in which land and resources, the homelands, are managed over time.

Kowalsky became the director of the University of Alaska Fairbanks Rural Alaska Honors Institute during its fourth year in 1986 and remains in this position to the present. He resides with his wife and three children in Fairbanks.

Teri Lee

Teri Lee has served as Communications Director for California's Statewide MESA program since 1989. Previously she was involved with a school change program working in the Oakland and San Francisco school districts. Lee has spent several years as a journalist and as a media consultant. She received her master's degree in journalism from the University of California – Berkeley and received her bachelor's degree in communications from Stanford University, in Stanford, CA.

JoAnn Moody

JoAnn Moody has been at the New England Board of Higher Education (NEBHE) for 13 years, beginning as Director of Government Relations and now serving as Vice President as well as Director of NEBHE's "Equity and Pluralism" Action Program.

Moody earned her Bachelor of Arts degree at the College of William and Mary in Williamsburg, VA, her Ph.D. in English Literature from the University of Minnesota, in Minneapolis, and her J. D. from Northeastern University Law School in Boston. She was a tenured associate professor of English and American Literature before earning a law degree and moving into higher education administration.

At NEBHE, Moody has organized numerous academic support networks and mentoring relationships for students of color on New England's predominantly White campuses. Currently she is focusing on how to help White faculty learn the communication skills they need to be better mentors to students of color and first-generation college students. This work will probably lead to a monograph, several videotapes, and actual workshops where faculty can begin to bridge the cultural divides and class differences that often separate them from students seemingly unlike themselves.

Moody also directs the New England portion of the "Compact for Faculty Diversity" launched in 1992 along with the Western Interstate Commission for Higher Education and the Southern Regional Education Board. The Compact will ensure up to five years of financial aid to underrepresented graduate students of color majoring primarily in science, math, and engineering and who are committed to college teaching after receipt of the doctorate. The Compact also guarantees faculty mentoring for its "Doctoral Scholars" within their graduate departments, supervised teaching opportunities and a Teaching Institute where Scholars can hone their skills especially in collaborative learning, networking opportunities both nationally and regionally, and job placement assistance in finding junior faculty positions.

Patricia Neri

Patricia Neri has served as the Coordinator of the Tech Prep Associate Degree Program at the Community College of Rhode Island, in Warwick, RI. In 1991, this statewide Program received national recognition as one of three model TPAD Programs in the country. As Program coordinator, Neri works directly with Tech Prep students, assisting them with their career and educational plans. Neri also coordinates many of the Tech Prep Program activities and serves as a liaison between Tech Prep students and the college's faculty and staff. Previous to this position, Neri coordinated a Career Placement Program and a Life Skills Program for high school and college students. Currently, Neri is a member of the Community College of Rhode Island's Sex Equity Committee and the statewide Tech Prep Advisory Committee. She served as a member of the Rhode Island Department of Education's statewide Long Range Tech Prep Planning Team. Neri received a bachelor's degree in human studies from the University of Rhode Island, in Kingston. She is currently enrolled in the University's graduate program in adult education.

Lance Schachterle

As Assistant Provost for Special Programs at Worcester Polytechnic Institute, in Worcester, MA, Lance Schachterle is in charge of first-year and precollege academic program development. He has overseen the Interactive Qualifying Project program (with its extensive experimentation in mathematics and science curriculum planning), and in 1987-88 organized the School-College Collaborative in Mathematics and Science as an outgrowth of education projects. He has also helped to develop Worcester's "Global Perspective Program," which provides opportunities for Worcester Polytechnic Institute students to study in more than eighteen locations abroad.

Schachterle currently is interested in exploring pre-college-to-college collaborations that contribute fully to professional development of all participants and engage all parties in curricular innovation with direct applications. He has also been involved extensively in the establishment and management of the Massachusetts Academy for Mathematics and Science, the first publicly-funded high school in Massachusetts at a private college. Both at the Academy and at Worcester Polytechnic Institute, he has helped to structure programs to serve student populations currently underrepresented in mathematics and science. Presently he is working with colleagues to create the first full-scale program at Worcester Polytechnic Institute to enable students to achieve teacher certification in Massachusetts as part of their four-year Bachelor of Science degree in mathematics or science.

Cheryl Serra

Cheryl Serra served as Marketing Coordinator of the Tech Prep Associate Degree Program at the Community College of Rhode Island, in Warwick, RI, from January 1993 until the spring of 1995. In this capacity, Serra was responsible for the development and national dissemination of Tech Prep promotional materials which included program guides, student handbooks, newsletters, and videotapes. The development and dissemination of these materials was funded by a United States Department of Education grant.

Serra currently works for the Career Pathways Program at the Community College of Rhode Island. This Program operates as part of a consortium comprised of Career Pathways staff, the director of Cooperative Education at the college, and representatives of the state's career and technical centers. The Career Pathways Consortium, along with representatives of comprehensive high schools in the state, have developed a workplace readiness curriculum which is available to instructors at the career and technical centers and the comprehensive high schools in Rhode Island. Other Career Pathways objectives include providing in-service training to instructors and disseminating Program information.

Prior to being named Tech Prep Marketing Coordinator, Serra was employed as a reporter for newspapers in Connecticut and Rhode Island. She has won two awards from the Rhode Island Press Association for her coverage of local and educational issues.

Serra received her bachelor's degree from Southern Connecticut State University, in New Haven, CT, and is currently enrolled in the graduate program in college student personnel at the University of Rhode Island, in Kingston.

Donald M. Stewart

Donald M. Stewart is President of the College Board, a post he has held since January 1987.

Before coming to the College Board, Stewart had served for ten years as the sixth president of Spelman College, the 113-year-old historically Black women's college in Atlanta, GA. At the University of Pennsylvania, in Philadelphia, PA, from 1970 to 1976, Stewart served as executive assistant to the president, as an instructor in public policy analysis, and subsequently as Associate Dean of Arts and Sciences and Assistant Professor in the Department of City and Regional Planning. During this period he was also director or coordinator of programs in community leadership, continuing education, and higher education research at the College of General Studies and the Fels Center of Public Policy.

Previously, Stewart was a staff member of the Overseas Development Division of the Ford Foundation from 1962 to 1969, with assignments in Laos, Nigeria, Egypt, and Tunisia, as well as in the Foundation's New York office. He served ultimately as Program Officer in the Foundation's Middle East-Africa Program.

Stewart earned his Bachelor of Arts degree in political science at Grinnell College, in Grinnell, IA, in 1959, and a Master of Arts degree in political science as a Woodrow Wilson Fellow at Yale University, in New Haven, CT, in 1962. At Harvard University, in Cambridge, MA, Stewart earned Master of Public Administration and Doctor of Public Administration degrees in 1969 and 1975 respectively. At present, Stewart is a member of the Visiting Committees to the Graduate School of Education and the John F. Kennedy School of Government at Harvard. Stewart served as a resident Fellow of the Kennedy School's Taubman Center for State and Local Government in the spring of 1995.